THE MARINE REVIEW

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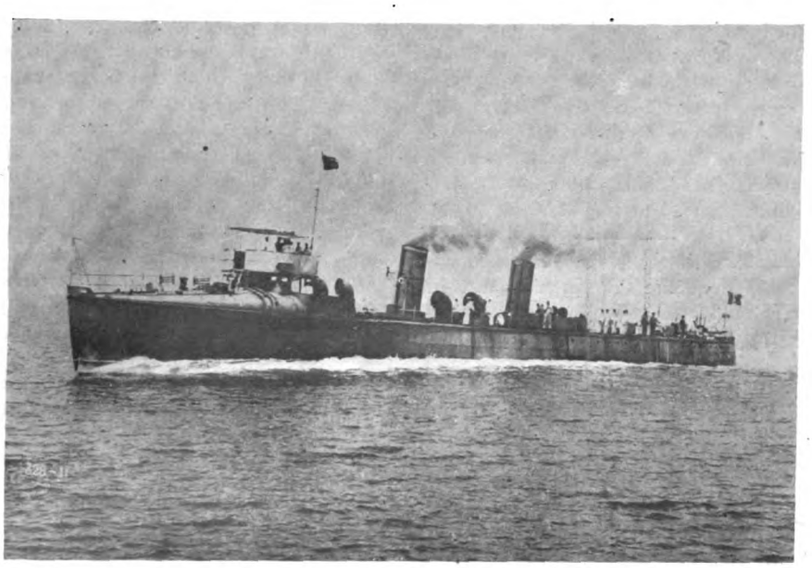
THE ITALIAN NAVY.

In 1898 Messrs. C. & T. T. Pattison, of Naples, were commissioned by the Italian government to build a number of 30-knot destroyers. The design and working drawings of the hulls and machinery were supplied by Messrs. John I. Thornycroft & Co., of Chiswick and Southampton, the boats being of a similar type to those built by them for the British and Japanese navies. There is kindly supplied herewith by Messrs. Pattison through Thornycroft, a drawing showing a section and plan of the Nembo, the first of the eight destroyers built by them in Naples, which clearly shows their general arrangement and construction, and a view of the Espero, one of the Nembo class traveling at full speed. The dimensions of this class are as follows: Length 210 ft. 0 in., beam 19 ft. 6 in., draught 7 ft. 6 in. The engines are of the four-cylinder, triple-expansion Thornycroft inclined condensing type each set having four cylinders as follows: High pressure cylinder 22 ins. in diameter, intermediate cylinder 29 ins. in diameter, and two low pressure cylinders each 30 ins. diameter. The stroke is 18 ins. The contract is for 6,000 I. H. P. and the designed boiler pressure is 220 lbs.

The armament consists of one 12-pounder quick firing gun and five 6-pounder quick firing guns, and there are two torpedo tubes.



TORPEDO BOAT ESPERO UNDER FULL SPEED.

All the eight destroyers of this class have been launched and have fulfilled most satisfactorily the guaranteed conditions, each boat attaining a speed of at least 30 knots. It is interesting to note that they were the first destroyers to be built in Italy and they reflect great credit on the builders, as the results obtained with them were as good as those obtained by Messrs. Thornycroft in this country with boats of similar design.

Messrs. Pattison also obtained orders for four first class torpedo boats from designs supplied by Messrs. Thornycroft, which resembled boats recently built at Chiswick for the British government except that twin screws were fitted instead of single screws. These boats also have gone through their trials with great success.

The following table shows the mean speeds obtained on the 3 hours' official trial of six of the torpedo boats.

Pegaso	25.46	knots
Perseo	25.72	"
Procione	26.02	"
Pallade	26.63	"
Cigno	26.40	"
Cassiopea	25.40	"

The contract speed was 25 knots.

It will be seen that this was well exceeded in every case, the Pallade, for example, making 26.63 knots.

Subsequently to the placing of these orders the Italian government called for tenders from Italian builders for destroyers and torpedo boats which were to be of Thornycroft type. Messrs. Ansaldo Armstrong & Co., of Genoa, and Messrs. Odero fu Alesso of Sestri Ponente became licensees of Messrs. Thornycroft in Italy, and orders were placed with the former firm for four destroyers and with the latter for six torpedo boats, Messrs. Pattison also getting six additional torpedo boats.

In the design of the new destroyers Messrs. John I. Thornycroft & Co., Ltd., at the desire of the Italian government, arranged for complete coal protection of the engines as well as the boilers of both types of boat. In the destroyers the engines are echeloned and each engine is in a separate water-tight compartment.

The leading dimensions are: Length

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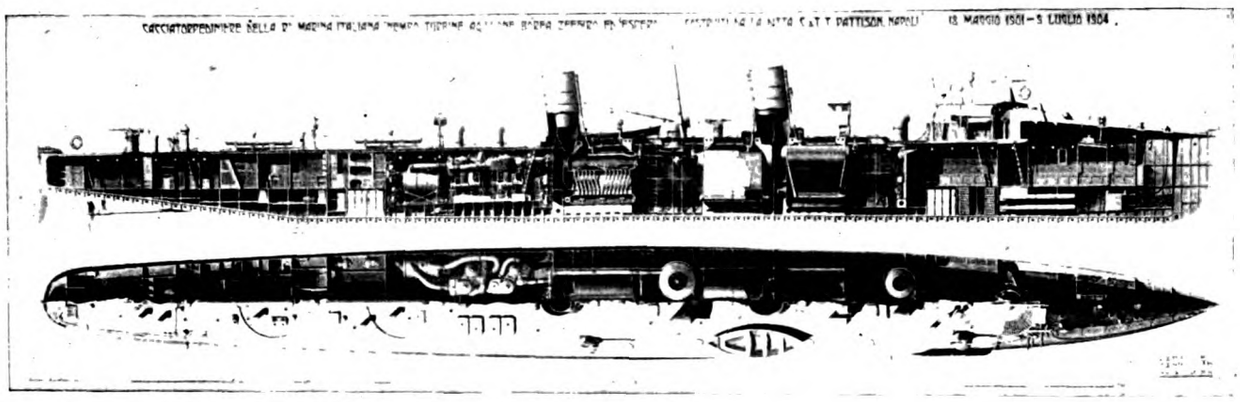
211 ft. 6 in., beam 20 ft. 0 in., draft 7 ft. 6 in.

The engines are of the same type as those of the Nembo class already described, but the cylinders are 21 in., 28½ in., and two of 30 in. diameter by 18 in. stroke. There are, as in the



SECTION AND PLAN OF THE NEMBO.

Nembo class, three Thornycroft water tube boilers.

The armament consists of four 12-pounder quick firing guns, and there are three torpedo tubes. The full complement of men is fifty-three in both the Nembo and Bersaglieve classes.

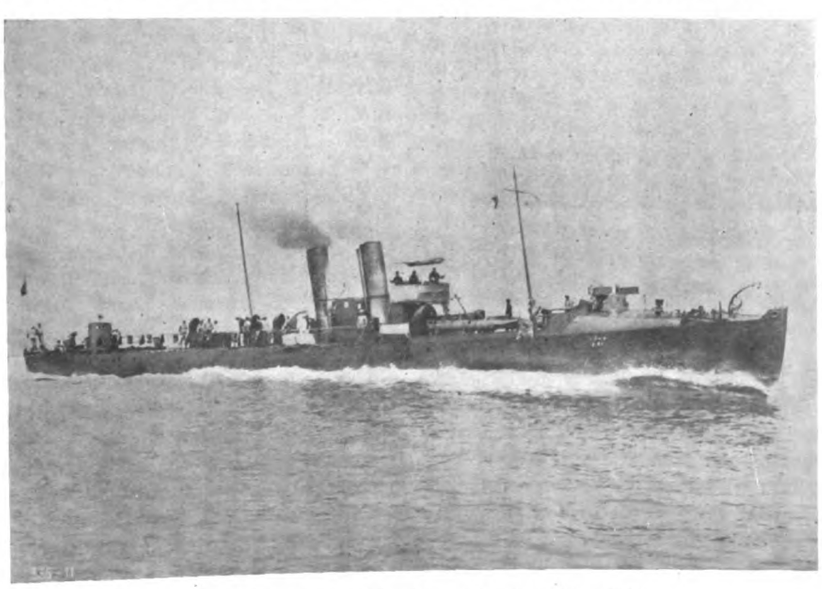
It may here be mentioned that Messrs. Ansaldo Armstrong & Co., are also now building six stock destroyers identical in all respects with those of the Bersaglieve class for the Italian admiralty.

Twenty-four of the thirty Thornycroft water tube boilers required for these ten destroyers have been or are being built by Messrs. Thornycroft at Chiswick, the remaining six being built, under license, by Messrs. Pattison at Naples. The leading dimensions are as follows: Length 164 ft., 0 in., beam 17 ft., 4 in., draft 7 ft. 0 in.

The engines are of Thornycroft type and consist of two sets of vertical triple-expansion condensing engines with three cylinders 17 in., 23½ in. and 36 in. in diameter, the stroke being 14 in. They are capable of developing about 3,000 I. H. P. There are two Thornycroft water tube boilers in separate water-tight compartments, which supply steam at 200 lbs. pressure. The armament consists of three 3-pounders and there are three torpedo tubes.

There is herewith shown an illustration of the Cassiopea, one of these 25-knot torpedo boats, traveling at full speed. Three of these vessels have been tried and have exceeded their contract speed, the Calliope having attained a speed of 26.38 knots.

Mr. T. Ashley Sparks has been admitted to partnership in the firm of Funch, Edye & Co., Maritime building, 10 Bridge street, New York.



TORPEDO BOAT CASSIOPEA GOING AT FULL SPEED.

SUBMARINE BOAT TRIALS.

The concluding trials of the submarine boats Lake and Octopus took place at Narragansett bay recently and the board of judges has returned to Washington to prepare its reports.

On May 17 the Lake gave an exhibition of maneuvering to prove the worth of her engines and motors and her versatility under many conditions. Later on the same day she began a 30-hour endurance test in which she acquitted herself with much credit, it being observed that her radius of action under gasoline engines, carrying the normal amount of fuel, was about 440 miles. The test being made in the bay, the Lake cruised up and down at the rate of 7.25 knots, the distance being accomplished in four hours, 13½ minutes, using about 110 gallons of the normal load of 1,500 gallons of gasoline. Emergency tanks, however, enable the Lake to carry about 4,500 gallons of gasoline should the occasion require. The machinery stood this test well.

One of the Lake's reversing trials was of interest because of the fact that the reverse was made by merely changing the pitch of the screws, rendering the stopping or reversing of the engines unnecessary. Going ahead full speed on the surface with both engines, the pitch was changed and the boat was reversed, coming to a standstill in one minute and three seconds.

The trials of the Octopus for torpedo practice were conducted on May 20 in Coddington cove. The target consisted of two rowboats 500 ft. apart, supposed to represent a battleship. The range was 800 yards. With the boat running in a submerged condition at full speed and taking observations by the periscope, the first torpedo, fired from the port tube, ran straight to the target, then turned to a sharp angle to the right. The second stuck in the starboard

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tube and the third went straight but failed to carry further than 500 yards.

Anchor gear trials and wireless tests were also conducted successfully. The Octopus later fired a torpedo from the starboard tube very successfully. On this day the Octopus for the second time in that week lost a torpedo. They are valued at $3,000 apiece and are the property of the government.

The submarine Lake was given her submerged speed trial May 21, in addition to which she was also subjected to maneuvering tests. She was sent over the measured mile course three times. On the first run, with the tide and against the wind, she covered the course at a rate of speed of 7.72 knots per hour. On the next run, against tide and with the wind, she developed speed of 5.69 knots an hour. On the third run—against the tide—the speed was 5.61 knots.

In being sent over the course full speed and requiring to be stopped and backed, the Lake accomplished the feat in 42 seconds. Sealing her top and dropping to a 20-ft. depth was accomplished in 7 minutes 19 seconds. This was followed, as required, by anchoring in 40 ft. of water, after which the boat returned to the harbor.

The torpedo firing trials and the run in the open sea were conducted May 22. The torpedo launching trials took place in Coddington cove, with the small boats 300 ft. apart as a target. The range was 800 yards. The armiscope was used for observation of the first two shots, but the third observation was made from the conning tower. The first shot was successfully launched from the starboard tube, although the starting lever of the torpedo failed to trip. The second torpedo, fired from the port tube, crossed the line between the two target boats. In starting to turn to discharge a torpedo from her stern tube the torpedo was prematurely discharged and went only a short distance. All three of the torpedoes were later picked up. The maneuvers at a depth of 10 ft. were next successfully accomplished, after which the Lake went to sea for her trial in light and awash conditions. These tests were well withstood, although a high sea was running.

On May 23, the Lake in submerging herself went down 135 ft., 5 ft. deeper than any submarine had previously gone with human beings aboard. It required just 19 minutes and 18 seconds from the time the Lake was sealed for her to reach the bottom, the descent from 30 ft. below the surface being accomplished in three minutes and 45 seconds. No water leaked into the Lake in this trial and her engines were without damage.

The Burger subsurface model was also given a trial by the board, making three runs over the measured mile, the first at a rate of 8.93 knots, the second at a rate of 8.59 knots and the third at a rate of 9 knots, the mean speed being 8.78 knots. This boat is but 35 ft. on the water line and is propelled by a 28-H. P. gasoline engine.

On May 24 the Lake tested her ability at the bottom, showing the usefulness of the boat for mining, countermining and cutting cables, the diving compartment being occupied on this occasion by three members of the Lake's company, the water being kept out by air pressure from the inside equal to the water pressure at the opening, through which counterfeit mines were anchored on the bottom, and a demonstration was also made of the ease with which the enemy's mines may be exploded by means of an electric current from the Lake led through the opening of the diving compartment.

In the process of mining and countermining the contact of the Lake with the bottom was avoided by the use of wheels which were lowered, and on an uneven bottom the boat ran some distance on them, with a minimum of unevenness, owing to a cushioning device on the wheels.

The interesting question now arises as to whether the tests have been completed as required by law, congress in extending the limit at first fixed for the completion of the tests having set May 29 as the date for the conclusion. At last accounts the 200-ft. submergence test of the Octopus had not been completed owing to the rough water, but it is the belief of the officials that the spirit of the law has been complied with.

ROYAL YACHTS.

The Victoria and Albert, in which the king and queen have cruised in the Mediterranean, is the largest and most magnificent of all the royal yachts. It is a vessel of 5,000 tons, and was only launched a year or two ago. Next to it comes the Standart, of 4,334 tons, which belongs to the czar, and third in order is the kaiser's yacht, Hohenzollern, which is of 3,773 tons, and was launched at Stettin in 1893. The yacht belonging to the king of Siam is a man-of-war, the Matsu-Chakri, of 2,092 tons, and was launched at Leith in 1892; while that belonging to the khedive is still larger, for it is of 3,350 tons, and though it was built as long ago as 1865, is the most luxuriously fitted of all the royal yachts. The Prince of Monaco does his deep sea soundings in the Princess Alice, 1,368 tons; the king of the Belgians' yacht is the Alberta, 1,332 tons, launched in 1896; the king of Italy owns a small yacht, the Iela, the king of Spain the Giralda, and the king of Portugal the Amelia. It is a curious thing that a large number of these royal yachts were built in Scotland.

VALUE OF PERSONNEL.

A great steel-maker once said that he considered his trained staff a more valuable asset than his buildings, his plant, and his machinery; that he would rather a great fire should destroy the whole of his property than he should lose the services of the personnel of his works. If one comes to think of it, this is hardly more than a truism, for plant and buildings, even of great value, can be quickly replaced, and that with certainty, but it takes years to mature men of experience, and even then—for human beings vary so much more widely than machines—one can never tell how a man will fit a position until he has been tried in it. Fortunately, the staff of an engineering works is not apt to disappear at a blow; but in all establishments the process is always going on to some extent, if only through the natural cause of death and decay. It is surprising how little provision is generally made for replacement. Often, when proprietors or general managers are in a confidential mood, one will hear that they really do not know what they would do if Mr. Blank left; but they defer taking precautions against such a catastrophe until the evil day arrives. Truly one cannot insure against the loss of a valuable servant, as one can against the burning of a workshop; but certain precautions can be taken.

The man who has been brought up in a works, and has won his way in them to a high position, is a more valuable servant than one who is introduced from without, because he has an affection for the alma mater of his mechanical training, a feeling of brotherhood towards those with whom he has been so long working—of paternity for the good reputation he has himself helped to create—and this begets enthusiasm of a kind never engendered by monetary considerations alone, even in an age said to be, above all things, prosaic and mercenary. These generally unconsidered elements in the policy of management tend more toward smooth working and material success than is often imagined. —*Engineering*, London.

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ELECTRIC UNLOADING CRANES FOR PANAMA.

The accompanying illustrations show one of a lot of eight cranes now under construction by the Shaw Electric Crane Co., of Muskegon, Mich., for the Panama Railroad Co. They are for use in handling miscellaneous freight at the Laboca wharf which is the Pacific terminus of the railroad.

The cranes were designed to meet the peculiar conditions existing at the wharf, among which may be menioned a tidal variation of about 20 feet.

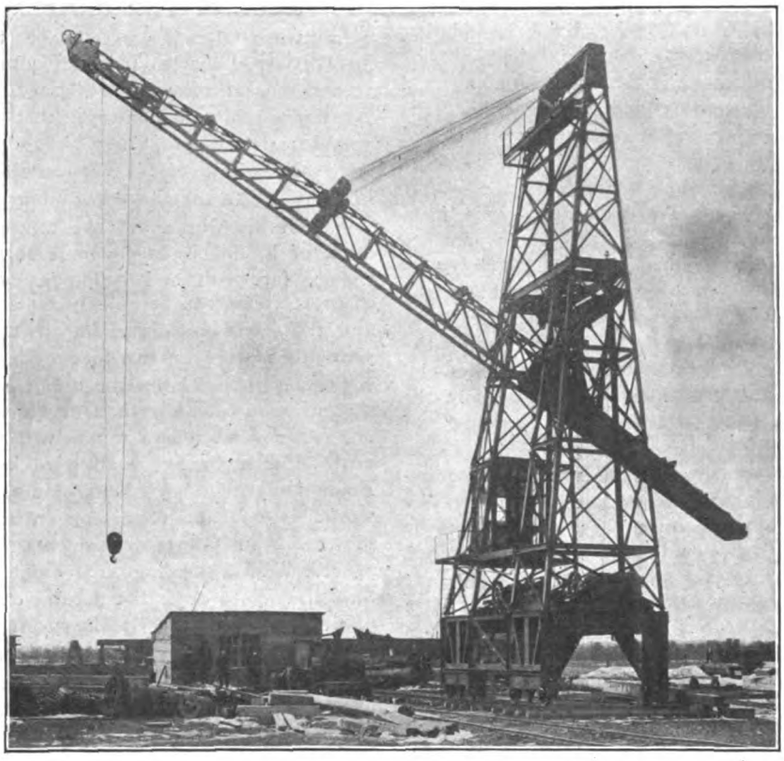

FIG. 1.—ELECTRIC UNLOADING CRANE AT PANAMA—WORKING POSITION.

The boom, 80 feet long, is shown in Fig. 1 in its working position, standing at an angle a little over 30 degrees from the horizontal. It is required that the outer end should stand at sufficient height to carry loads over the decks of the largest vessels at high tide, while the other end must be low enough to project inside of the warehouse door.

The boom may be raised to the position shown in Fig. 2, carrying the outer end clear of all parts of vessels and withdrawing the inner end from the warehouse. With it in this position, vessels may be docked and the cranes placed opposite the various hatchways in proper position for loading or discharging cargoes.

The main frame, or tower, is of steel construction and stands 62 feet above the track. There is a clear opening through it 10 feet wide, in which the boom is suspended and through which the loads are carried. The base is so constructed that the crane can travel over freight piled to a height of 6 feet between the tracks, and so that goods may be trucked directly from under the crane to the warehouse. The space between the front of the warehouse and the edge of the wharf was sufficient for a track of only 11 feet gage. This, together with the necessary height and reach, made the question of stability a serious one. Although the weight of the frame and machinery has been so disposed that the crane will be stable with a load 25 per cent above normal capacity in the extreme position, clamps have been provided which are always in engagement with the rear rail, to prevent the crane from tipping if a load should become fouled on a hatchway or other part of the vessel.

The crane is mounted on six wheels, four under the front and two under the rear. Anticipating the possibility of uneven settling of the wooden wharf, the wheels are carried in equalizers, so arranged as to compensate for any probable irregularities of track without straining the structure.

The machinery for the various movements, is placed in the base of the tower, adding to the stability of the crane, and giving easy access for inspection. For convenience in shipping and erecting, each set of machinery is mounted upon a separate frame, which is easily handled and put in place.

The crane has a regular working capacity of four tons, and a reach of 40 feet from the center line between rails to the extreme outer position of load. The total height of hoist is 70 feet, and the speed of hoisting with full load is 150 feet per minute. The load can also be racked out and up at a speed of 150 feet per minute. The other two movements, travel and boom hoist, are relatively slow, being required only in setting the crane in position for service.

The hoist is operated by a 65-horsepower motor, the rack motion by a 40-horsepower and the travel and boom hoist by 24-horsepower and 8-horsepower motors respectively. Automatic switches are provided to prevent overtravel in hoisting and racking out, also an overload switch for the hoist machinery. All movements are under the control of one operator, whose cab is so located as to give him the best view of his work.

The crane weighs nearly 50 tons, and with the boom in the raised position as shown in Fig. 2, it stands 90 feet above the wharf.

The motors and controllers, as well as all structural work and machinery, are the product of the Shaw Electric Co.'s plant at Muskegon.

INTERNATIONAL MERCANTILE MARINE.

Voting trustees of the International Mercantile Marine Co., including J. Pierpont Morgan, J. Bruce Ismay, W. J. Pirrie, P. A. B. Widener and Charles Steele, have issued to all holders of voting trust certificates for stock of that corporation a circular requesting authority for an extension of the company's voting trust for another five years, to Oct. 1, 1912.

The trustees make the statement that the holders of large amounts of the preferred and common stock voting trust certificates believe that it is of great importance to the shareholders that the policy of the present management be continued until plans now under way for improving the company's fleet and permanently establishing its strength are completed.

As the present voting trustees, who were elected in 1902, have done much toward making the company so prosperous, it is believed that the holders of the voting trust certificates will consent to the proposed extension.

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NEW YORK SHIP CHANNEL.

The recent alarming number of strandings in the main ship channel, including that of the big North German Lloyd liner Kaiser Wilhelm der Grosse and other of the big liners, is naturally the source of great concern on the part of those interested in the shipping welfare of the port of New York. Those most interested declare that the government should immediately take steps to see that the conditions are at once improved upon, which can be done either by dredging out the main ship channel to its full width and depth or else by the early completion of the Ambrose channel to such a point that it shall be navigable by daylight as is provided in the latest rivers and harbors act, which gives the secretary of war authority to permit the use of such part of the channel as shall be available to steamers drawing 27 ft. or more.

INVESTIGATION OF DISPUTE.

Lawrence O. Murray, assistant secretary of the department of commerce and labor, and Herbert Knox Smith, chief of the bureau of corporations, have gone to New York to preside at the trial of charges preferred by Theodore T. Mesereau, United States inspector of steam boilers, against his colleague on the New York inspection board, Henry M. Seeley, United States inspector of hulls. The charges are the outcome of differences regarding the management of official business, which differences are of long standing. The New York inspector's office was given a clean sweep following the Slocum disaster and Inspector Harris was placed in charge, the two contestants being assigned to the board. Under the law they are to act together in all matters but it is generally understood that they have been at odds from the start.

TO COMMAND THE LUSITANIA.

Capt. J. B. Watt has been appointed to the command of the new Cunard line turbine steamer Lusitania, which is one of the mammoth liners now being completed. Capt. Watt joined the Cunard company in 1873 and has passed through every grade of command. Among the vessels he has commanded are the Umbria, Etruria, Lucania and Campania. Capt. Watt is a native of Montrose and served his early years in the clipper sailing service. The Lusitania is to leave Glasgow early in July to undergo her trial runs, and it is expected that she will arrive at Liverpool about the second week in July.

MARCH'S SEA RECORD.

Marine underwriters were hard hit in the month of March. Figures now at hand, giving the casualties of shipping of all the world for that period, show a total loss of 87 sailing vessels and 34 steamships.

Of serious accidents to wind-driven craft, there were 142, while 347 steamships fell upon evil ways. This grim record of a single month has rarely been exceeded, and affords eloquent evidence to substantiate the long-formed convictions of shipping men, that if March weather could be eliminated from the face of the deep waters, the percentage of marine disaster would be appreciably reduced.

Thirty-four steamships were totally wrecked, two of which sailed to that port from which no message ever comes.

In March, 14 steamships were stranded—either torn apart by the breakers or left to rust away. Five were sunk in collision, and fire destroyed two. One foundered at sea with loss of life; two were abandoned at sea before they had time to founder, and eight were condemned, after reaching port, and sent to the junk pile.

Of these vessels three were registered under the American flag, one was an Australian boat, one Brazilian, 18 British, one Danish, one French, three German, one Japanese, three Norwegian, and two Spanish. Of the sailing vessels lost in March five were lost in collision, 31 driven ashore in

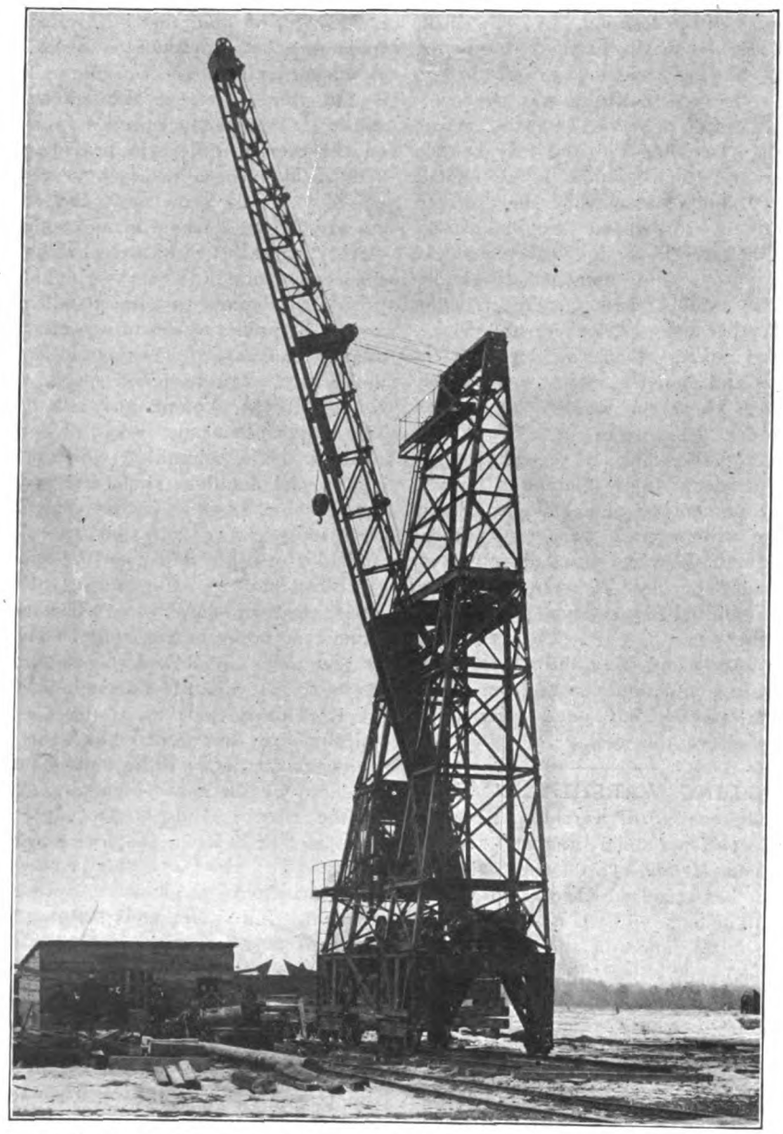

FIG. 2.—ELECTRIC UNLOADING CRANE FOR PANAMA—BOOM RAISED FOR MOVING.

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gales, three were burned, four foundered, seven were abandoned, and 34 were condemned, their names being taken from the register. Of the sailing vessels, 10 were American, one Brazilian, 21 British, three Danish, 12 French, two German, 10 Italian, 17 Norwegian, two Portuguese, one Spanish, five Russian, two Swedish, and one from Uruguay.

So far as accidents to steamships are concerned, collision was the principal cause of resort to the repair yards. One hundred and fifty vessels came together, which is no small record, and 73 steamships were driven ashore in storms, but later hauled off by the wreckers and taken to the ship yards. Fire damaged 16 steam-driven vessels, one was taken from traffic because she leaked, and 54 required repairs because of defective engines and boilers. Stress of weather caused 54 vessels to lay up for repairs.

As in the case of the steamships, the accidents to windjammers show a large percentage of collisions. Forty-seven sailing craft were thus injured in March, 32 were stranded, four were damaged by fire, 21 were leaky, and 38 suffered severely in stormy weather.

In April and May the reduction of casualties and total losses from March were marked, but nevertheless they were above the average.

COALING WARSHIPS AT SEA.

"The coaling of warships at sea is a subject of perennial interest," says the *Glasgow Herald,* "and from time to time has aroused discussion among naval officers. There is certain to be a reconsideration of the matter, since Germany has just decided to make practical tests. Two of her old battleships, recently removed from the effective list, are to be adapted for the carrying of 5,000 tons of coal. These vessels are the old Preussen, built 34 years ago at Stettin, and of 6,770 tons displacement, and 14 knots speed, and the sister ship Friederich der Grosse, built about the same time at Kiel. When equipped as coal-carriers they will accompany the fleet, the first named going with the battleships and cruisers, and the other with the torpedo craft. Various systems of transferring coal from them to the fighting ships will be tested. The idea is to evolve a satisfactory design to enable special coaling steamers to be built under next year's navy program. But it remains to be seen whether financial consideration will justify the reservation during peace times of these ships, because it is necessary that they should have a speed equal to that of the slowest fighting ship in a squadron; and this means a high initial cost, and therefore a considerable amount of capital lying idle. It is true that constant practice ensures reliability of such conveyors as are required for transferring the coal from one ship to another at sea; but there are many who hold that with effective appliances little practice is necessary to ensure expeditious working. That is the view taken at the admiralty, and therefore reliance will be placed on the merchant fleet to provide colliers at high speed when they are required. At the same time the naval reserve at the dockyards make themselves cognizant with the working of the conveyors. It seems doubtful, however, whether an admiral will coal at sea, or prefer to get into some convenient anchorage. The United States authorities seem to favor special colliers; but there again the extent of the merchant marine may affect the problem. The admiralty, while building special distilling ships and special repair ships, have so far set their face against special colliers for the fleet, and it is possible that even the special distilling and repairing ships will be little used by our fleets. The most important point in ensuring reliability is that ships should be self-contained, so as to act with the fullest independence. This is the reason why the admiralty are determined that the repairs, as far as possible, must be carried out by the ship's company. This is the most reasonable procedure, as it creates or develops the true esprit de corps. The chief engineer should be the principal mechanical authority, carrying full rank and status. His concern may be chiefly with the propelling machinery, and all steam, gas or oil prime movers, but he should be an expert also in electrical and hydraulic work. For the present, however, the torpedo lieutenants are to be responsible for the electrical, and the gunnery engineer for the hydraulic gun-mounting, machinery. That is the order now officially promulgated."

SCOTTISH ENGINEERS AND SHIP BUILDERS.

On May 3 the Duke of Argyll, K. T., laid the memorial stone of the new building in Elmbank street, Glasgow, which is to be known as the Institution of Engineers and Ship Builders in Scotland. A glass jar containing a number of documents and papers was placed in the cavity. The president of the society, Mr. James Gilchrist, then gave a brief historical account of the growth of the institution.

The new building will be arranged internally on three floors and a basement, with lecture halls, ante-rooms, council and committee rooms, library, reading, and secretarial rooms, all on a scale adequate to the demands of the institution, which has now a membership of about 1,600. The accommodation will also partake somewhat of the nature of a club, where members may meet and confer in a social as well as a business and professional way. The lecture hall, on the upper floor, will be 72 ft. by 40 ft., and will seat an audience of from 450 to 500. A lesser lecture hall, 40 ft. by 22 ft., has been arranged on the ground floor. The library, reading room, and offices will be on the street floor, while the basement will be devoted to stores for books and documents and to the heating and lighting plant. The cost of the buildings, with site, etc., will be between £25,000 and £30,000.

JOHN BROWN & CO.

The report of John Brown & Co., of Sheffield, Eng., which is soon to be published, is being awaited with some interest in shipping circles. The net profit last year, after allowing for debenture and mortgage interest, was £223,882, compared with £198,936 in 1905, and a ten per cent dividend was paid, while £40,000 was placed to extension account. For the year ended March 31, last, a distribution of at least 12½ per cent is looked for and there are some even sanguine enough to expect 15 per cent.

In their ship building department at Clydebank there has been and still is plenty of work. In dock fitting out there is the leviathan turbine Cunarder Lusitania. Work on her is now well up to time and she goes down the river on June 27 to prepare for her steam trials. The other day the paddle steamer Barry was launched for a Bristol Channel service. On the stocks or to lay down are three large steamers for the Federal Steam Navigation Co., the armored cruiser Inflexible, a turbine steamer for the Great Eastern Railway Co. and a 20-knot steamer for the Lancashire & Yorkshire Railway Co.

On June 1, the Cunard Steamship Co. inaugurated a new scale of remuneration to the officers of its various steamers, a substantial increase having been decided upon. This is designed to greatly benefit the officers of long and tried service and also to offer further inducement toward advancement to junior officers.

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MUNICIPAL FERRIES LOSE.

Deficits on the New York ferries continue to increase, while the demand for the extension of the municipal ferry system more than keeps pace with the loss. Commissioner Bensel says: "I estimate this year's loss on the Battery and Thirty-ninth street ferry at $150,000, while the Staten Island ferries will lose $300,000 more. We have no fund from which to pay these losses, which must be met by the sale of bonds, and I am quite unable to see where the matter is going to end. In the face of these facts we have a bill pending in the legislature to make the ferries free. In other words, the proposition is that instead of sinking nearly half a million every year in our ferries we are to sink millions.

"There must be an end to municipal ferry extension somewhere, but where is the line to be drawn? We cannot cut expenses in operating. When the Staten Island ferry was taken over we were told that New York city must have the finest boats on the bay. We have the finest in the world. We were told they must be speedy. We haven't the speed qualities of torpedo boats in these craft, but we have cut the time down until we burn just four times as much fuel as any commercial body would in operating the boats the same number of trips."

Commissioner Bensel further says that nothing has been formulated "which can serve as a check to the expansion idea. I hope we may, for we are rapidly approaching the danger limit, and while there is no danger of saddling the city with free ferries, you can't tell how soon it may come. Too many of the legislators are prone to vote, not in accordance with their best judgment, but in whatever way will best please the people."

THE AMERICAN SCHOONER.

From the two-mast schooner Polly, built in 1805 and of 48 tons, to the seven-master Thomas W. Lawson, built in 1902 and of 5,218 tons, is a "far cry;" and while these two craft are still afloat, it is interesting to note something of the development of the schooner-rigged vessels that are leaders in their class at the present day. Of these the Oliver Ames is the largest two-master, being of 456 tons and built in 1866 at Berkeley, Mass. Of the three-masters, the Aurora of 147 tons was the first one built, in 1831, but long since lost. The oldest three-master afloat at present is the Marie Pierson, launched in New York in 1864, and the largest the Bradford C. French, of 968 tons, built in Kennebunkport, Me., in 1884. The smallest three-master now afloat is the Mary and Anna Beswick, of 149 tons, built in 1891 at Milford, Del.

Coming to four-masters, the Northland of 2,047 tons, launched last year at Rockland, Me., is the largest afloat, while the first of the rig was the Francis C. Yarnall, built in 1881 at Wilmington, Del. The smallest four-master, a bald-headed schooner, is the Judge Pennewill, built at Bethel, Del., last year. The five-masters of special distinction are the Governor Ames, of 1,778 tons, built in 1887, she being the first one of the fore-and-afters to demonstrate that rig capable of off-shore sailing by making a successful voyage around Cape Horn when new; and the Kineo, being the only five-master built of steel. The largest five-master is the Jane Palmer of 3,138 tons, built in East Boston in 1903, while the smallest of that rig is the James Pierce of 1,664 tons, built in 1899.

With the beginning of the twentieth century came the first six-master, the George W. Wells, built at Camden, Me., in 1900. The largest vessel of this rig afloat (and of which six have so far been built) is the William L. Douglas of 3,708 tons, built in 1903. The Thomas W. Lawson has two distinctions; first, for being the only seven-master so far constructed, and second, she is the largest schooner in the world.

This brief synopsis of the development of schooner-rigged vessels shows two things; first, that the fore-and-aft rig is one that has withstood successfully the test of competition with steam vessels; and second, that the Lawson has been proved from her size to be somewhat of a freak vessel, so that in the six-master the limit of size for successful handling has evidently been reached.—*American Shipbuilder.*

NORTH GERMAN LLOYD'S NEW STEAMER.

The North German Lloyd Steamship Co. has ordered a new large passenger steamer to be built in the yards of the Vulcan Co. at Stettin for the line between Bremen and New York. This steamer is to receive the name George Washington, and will be 720 ft. in length, 78 ft. beam and 54 ft. in depth, with a gross tonnage of 27,000 registered tons, a draught of 33 ft. and a displacement of 36,000 tons. Her speed across the ocean is to be 18 knots and her engines will indicate 20,000 H. P. This steamer is intended to meet the demand of those with whom speed is a secondary consideration, and who prefer comfort and room to record trips. She will enter the service in the year 1909.

The North German Lloyd also has another large passenger steamer for the New York trade under construction with the ship building firm of Joh. C. Tecklenborg in Geestemunde, near Bremerhaven, of 17,000 gross registered tons and 14,000 I. H. P., a displacement of 26,000 tons, length, 614 ft.; beam, 68 ft.; depth, 42 ft.; speed 17 knots. This steamer will receive the name Prinz Friedrich Wilhelm, and is expected to enter the service of the company between Bremen and New York in the year 1908.

MERCHANTS' & MINERS' TRANS. CO.

The directors of the Merchants' & Miners' Transportation Co. in a meeting held at Baltimore recently, elected representatives of the New Haven & Hartford railway, which has recently acquired a very large interest in the company, to the board. E. P. Whitney, of Boston, and W. K. Cromwell, of Baltimore, resigned, and Charles S. Mellen and J. B. Hemingway were chosen to succeed them. Mr. Whitney, of Boston, also resigned as first vice president and was succeeded by N. W. James, Baltimore.

The Merchants' & Miners' Transportation Co. has formally taken over the Boston & Philadelphia Steamship Co., which was purchased from the New Haven & Hartford railway.

ADMIRAL COGHLAN RETIRES.

Joseph Bullock Coghlan, rear admiral, United States navy, recently retired from the service after passing forty-five years of his life therein.

Rear Admiral Coghlan fought in the battle of Manilla bay. He has been acting as commandant of the Brooklyn navy yard, and was succeeded by Rear Admiral Caspar Frederick Goodrich.

Not a little of Rear Admiral Coghlan's fame was won by the recital, at a Union League Club dinner, of the now well-known poem "Hoch der Kaiser," of which he is the author and which proved itself very troublesome for some time.

A new water line is in process of formation to operate between Boston and New York to be known as the Independent Navigation Co. Mr. Byron T. Pitts, formerly agent of the Joy line, will be general manager of the new company.

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THE MARINE REVIEW

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June 13, 1907.

OUR COURSE CORRECTOR.

The demand for a simple mechanical "Course Corrector" has grown sufficiently great in the past few years to warrant the production of same. It is to supply this want that the MARINE REVIEW has gone to the expense and trouble of producing a corrector that is especially adapted to the needs of the lake profession. The device is for the purpose of mechanically solving many of the simple problems of navigation which daily confront the masters and pilots of all vessels. In laying down courses so many disasters have resulted from a mistake being made in applying the deviation or variation the wrong way, even when the master had perfect knowledge of the rules of such application, that a mechanical device which is absolutely correct under all circumstances, should be viewed with much satisfaction by all navigators. The human mind is liable to error, but a machine which is correct in the first instance, will never make a mistake.

Objection is sometimes made by a few of our best educated officers that they prefer to trust to a paper, pencil and their own figures rather to any mechanical method of solving problems. There is no man who is so infallible in his calculations that a check is never necessary; and for the purpose of a check the device is invaluable to such navigators. We have all had the experience of making a mistake in adding a column of figures and being unable to discover it. But the adding machine never adds incorrectly, and what banking house or large commercial house is today without one of these valuable little mechanical devices?

To the beginner who is desirous of learning variation and deviation and their rules of application, the instrument will be found invaluable.

SAFE NAVIGATION.

The safe navigation of the lakes is dependent upon the course steered, hence the compass is the instrument to be relied upon. To be depended upon the master must have a knowledge of the azimuth tables in ascertaining the deviation of his compass, the taking of bearings of prominent points, lighthouses, and other objects shown on the chart, and from them fixing the position of his ship at frequent intervals; also the familiar use in laying courses and correcting same for variation, deviation, leeway, etc., the taking of soundings and the use of the safety curve in thick weather, etc. Leeway is an important factor in navigation, especially when a boat is in light trim with a strong beam wind. The correction for leeway many times is greater than the corrections for variation and deviation combined. The way boats are built now days, with deviations continually changing caused by a change in the trim of the hull together with the magnetic effects of an iron ore cargo, the position of master and mate is one of great responsibility, and both must be constantly on their guard to verify the ship's course and position by every means known to navigation. They cannot afford to miss even the slightest opportunity of verifying their work, so that recourse must be had to all the known methods that will apply in the various situations they find themselves. When azimuths are available no better means is afforded in the making of good courses; when azimuths are not available then other methods must take its place. The master and mate must study these methods as well as the azimuth mode.

The object of the MARINE REVIEW's nautical department is to make the work of those in the forward end of the ship easier and more pleasant. It is to bring all hands closer together, the master with his mates, the mates with the wheelsmen and watchmen, and the whole with the owner and manager. All we want is your confidence and interest in this matter and the MARINE REVIEW will do the rest. It is to be hoped that the instructive features of the paper will be read with interest from the master down.

WHAT OUR SALT WATER COUSINS THINK.

Lake masters and mates have not their equals in the world. When it comes to taking their boats through the intricate waterways connecting the lakes, and into the harbors and rivers, and landing and getting away again from alongside of a wharf, the skillful manner in which they perform it, invariably brings forth praise from those who see it and are competent to judge. One day recently while Capt. Wharry and a gentleman from New York were watching one of the largest steamers on the lakes, the D. J. Morrell, Capt. P. S. Millen, coming into the locks at the Sault canal, the New York man remarked with much enthusiasm and emphasis, that it was simply marvelous that such a large boat could come in without the aid of tugs. He said, if such a boat were to move around in New York harbor in that manner she would be attended by at least four

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tugs, as it would take that number to land her successfully.

It is marvelous, but we who are customary to seeing such sights every day give it no heed whatever, simply taking it as a matter of fact. Nevertheless, it is an exhibition of skill and fine judgment, and little wonder is it that it elicits so much astonishment and praise from those who see it the first time and are capable of judging the qualifications necessary in performing such a feat.

FREIGHT SITUATION.

The June movement of ore has been heavy, notwithstanding the delays in port, owing to congestion of the fleet. It is estimated that 6,500,000 tons will be moved during the present month. As an instance in the increase in the size of cargo, the average cargo delivered at the port of Cleveland last week was 5,242 tons, forty-nine vessels having delivered 257,200 tons during the week. This is very good work and a very high average for size of cargo. Ore in general is going directly forward to furnaces, and the transfer is for the main part directly from the vessel to the car.

The new steamer Thomas F. Cole delivered her maiden Lake Erie cargo at Fairport on Wednesday of this week, reaching Fairport about 5 a. m. and having her cargo of 11.385 tons worked out of her quite comfortably by 5 p. m. She was visited by Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., and Mr. E. C. Collins, traffic manager of the Pittsburg Steamship Co. This great steamer is a superb one in every way.

Coal is moving forward freely as many of the large carriers are carrying it. The rate remains the same as at the opening with the exception that a premium is paid on small cargoes to Lake Michigan ports. More coal has been rushed to the head of the lakes this spring than ever before and the northwest will be well supplied when the season ends.

IRON SITUATION.

A new record in pig iron production in the United States was established in May, according to the statistics compiled by *The Iron Trade Review*, which show a grand output of 2,291,030 tons, compared with 2,226,708 tons in April, a gain of 64,322 tons. The large number of furnaces in blast at the end of the month foreshadows a continued heavy production. The pig iron market remains quiet, but there are no signs of weakness. Heavy purchases of railroad equipment have been made during the week, including 6,000 cars for the Steel Corporation. Structural material is less strong, the orders being for small tonnages. The Grand Trunk railroad has purchased 30,000 tons of rails for 1907 delivery from the Lackawanna Steel Co.

AT HEAD OF THE LAKES.

Duluth, June 10.—Despite the extreme shortage of boats during the past week due to congestion at lower lake ports the movement of ore fell behind only in that an immense shipment would have been probable under favorable conditions. At times during the week the docks were badly crowded with ore and loaded cars but the despatch of the boats that were loaded was exceptionally good. On Sunday morning the unusual situation occurred of having no boats at the Missabe dock. Although some time is being lost this week on account of rain, a large number of boats are expected in the next few days and a movement from the head of the lakes of about 1,200,000 tons seems likely this week. The dock reports for the first seven days of June show the following shipments: Duluth, 430,736 tons in 1907, against 317,069 tons in 1906; Two Harbors, 294,876 tons in 1907, against 249,979 tons in 1906, and Superior, 289,352 tons in 1907, against 191,540 tons in 1906, an aggregate movement during the week this year of 1,014,964 tons, against 758,578 tons last year. The shipments from the Gogebic range through Ashland have been gaining but are not yet up to the corresponding figures last year owing to the delay in opening.

As will be noted in the statement below grain shipments have seen a good increase in the week past with a marked falling off in receipts. The trade is generally dull, however, the rate at 1⅞ cents is somewhat weaker and tonnage is limited. The feeling is strong locally that the fall crop will be very good. The receipts and shipments for the week ending June 8, are as follows:

	Receipts, week June 8.	Shipments, week June 8.
Wheat	477,372	1,220,355
Corn	.....	506
Oats	48,063	210,733
Rye	1,080	.....
Barley	33,150	37,989
Flax	174,037	389,265

Most of the lumber now being moved is that bought during the winter for lake shipment. There is but little spring buying. The steamer Sparta, operated by D. W. Mills, and built in Cleveland in 1874 for the ore trade, was this year rebuilt to carry lumber. She arrived at Duluth for her first load last Friday and took 900,000 ft. from the Northern Pacific dock.

New records were made at the head of the lakes ports during May for coal receipts and a large amount is expected in the coming week. At Ashland the coal receipts for the year up to June 1 amounted to 120,153 tons or 35,000 tons better than last year despite the later beginning. With the completion of the new Co-operative Co. dock the amount of coal handled through Ashland increase materially. The No. 3 dock slip, of the Pittsburg Coal Co. at Duluth, has been dredged out and is again open for boats after being out of commission for three weeks.

The south span of the Interstate bridge draw has been successfully raised by the wreckers and the following notice from the government engineer's office here has been issued in that connection:

"As soon as the south opening of the wrecked draw span is cleared and open for the passage of vessels, all vessels up-bound must use the draw opening, and all vessels down-bound must use the opening which is now in use (where the raft span was removed, after the wreck, to give a temporary passage. In other words, vessels going in either direction will take the right-hand opening. When the above arrangement takes effect, the order issued for this office under date of May 21, 1907, requiring vessels not to pass each other at the Interstate bridge will be cancelled. Further notice will be given when the south draw opening is ready for use, which is expected to be in a week or two from this date."

It is expected that the launching of the George F. Baker, building for the Pittsburg Steamship Co. at the Superior Ship Building Co. yards, will take place as planned next Saturday.

DESTROYED BY FIRE.

The main building of the Canadian Ship Building Co.'s plant at Bridgeburg, Ont., was destroyed by fire on the night of June 11. The fire was discovered by the night watchman, but before help could be procured from Bridgeburg and Niagara Falls the building had been practically destroyed. Great difficulty was experienced in subduing the flames, owing to lack of adequate fire-fighting facilities, the men having to work with buckets. Fortunately the vessel on the stocks for the Chicago & St. Lawrence Steam Navigation Co., was not injured.

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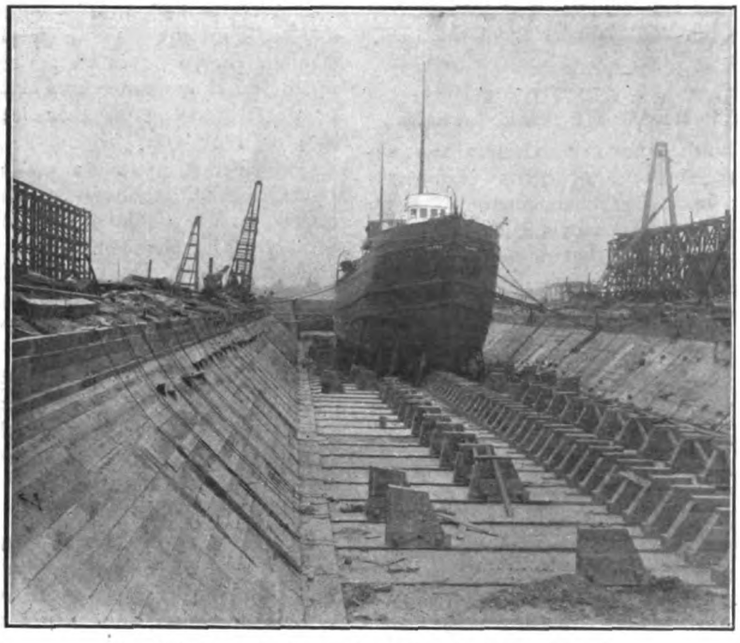
TOLEDO SHIP BUILDING CO.

The Toledo Ship Building Co. is making no particular splash, but a visit to its yard shows that it is doing a very profitable business in a very quiet way. The new dry dock, which is known as No. 2, went into commission on April 29 when it docked the little steamer Lakeside. As a working unit the dock is complete but the Great Lakes Dredge & Dock Co. have considerable work on hand before the great retaining wall at the head of the dock and its embankment are completed. When this is finished, the sight from the retaining wall will be an imposing one. It forms a natural platform from which thousands may easily witness future launches at this yard. In fact, the new dry dock will act as a launching slip for two building berths, one on each side of the dock. The berth to the right, being 110 ft. wide, is intended to accommodate the beamiest of passenger boats. While, as shown by results, the work of transforming this yard has been prosecuted with great energy, it will take the balance of the year to erect the punch and shear shop and put the entire yard into a well groomed condition. Meanwhile, the actual work of ship construction and repair is going on at a merry clip. In the MARINE REVIEW'S Ship Building issue of Jan. 3, the work performed at this yard since it was taken over by the Toledo Ship Building Co., was chronicled. Since then repair work has been pushed forward incessantly, though there are normally four or five weeks in the dead of winter when it is not advisable to attempt to operate a dry dock.

The Sahara went into No 1. dry dock Jan. 18 and came out Feb. 1.



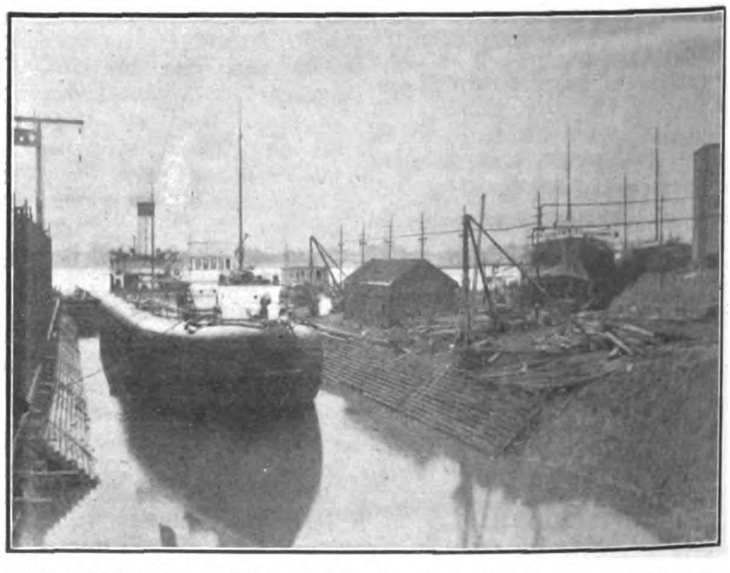
NO. 2 DRY DOCK WITH THE STEAMER SAXON DOCKED.

The H. S. Wilkinson went in March 18 and came out March 25. The Carrington went in March 25 and came out March 29. The Yuma went in March 30 and came out April 4. The Portage and Robert Holland occupied the dock from April 4 to April 8. The H. S. Sill went in April 26 and came out May 15, undergoing extensive repairs to her bottom. The John Ericsson went in for general repairs on April 17 and will come out of the dock during the present week. As stated, No. 2 dock went into commission on April 29, making repairs to the little steamer Lakeside, which were completed the following day. On May 1 the steamer Clarence A. Black went into the dock for repairs to her bottom and came out May 11. The steamer Warrington went in May 13 and came out May 18. The Saxon entered the dock on May 23 and will be in it for the balance of this week.

In addition to this program which, as seen, has practically kept the dry docks in continuous operation, save for the brief period in February when it was not profitable to operate them, repairs have been made in the open slips to twenty-eight steamers, including the Smeaton, Princeton, Cornell, Bunsen, Hoover & Mason, Eugene Zimmerman, W. C. Richardson, Marcia and many others. The Saxona and Maida are at present in the slips.

It is believed that the French cruiser Chanzy, which went ashore on one of the Saddle islands recently, will prove a total loss. Heavy seas interfered with the work of salvage and the vessel gradually filled.

The old wooden dry dock, which was sold by the government at auction at Portsmouth, N. H., recently, is to be towed to Lynn Harbor, Mass., by the purchaser, where it is to be broken up. A nose is to be built on one end of the dock in order to make the towing somewhat easier.



THE STEAMER JOHN ERICSSON IN NO. 1 DRY DOCK WITH THE SAXONA AND MAIDA IN THE SLIP.

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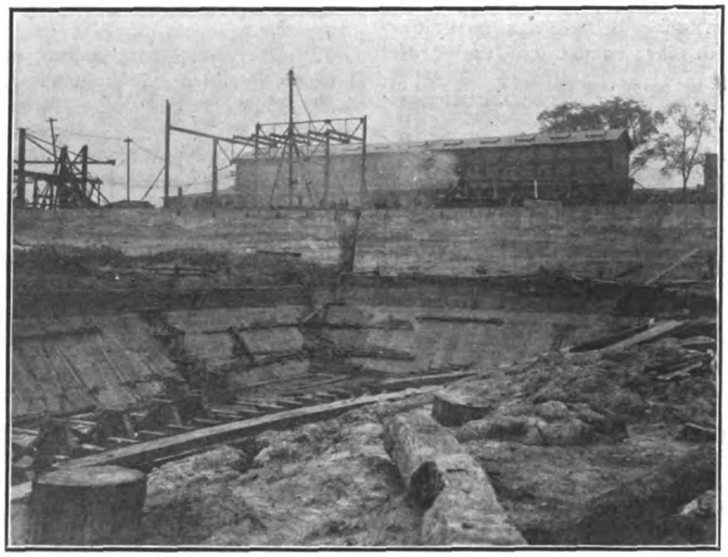
GRAIN HANDLING IN EARLY DAYS.

The following communication in the *Buffalo Express* on early methods of unloading grain is quite interesting:

An article in the MARINE REVIEW, Cleveland, O., May 30, gives a sketch of the easy work and methods in handling grain in Buffalo, with mention of the first elevator built, the Dart elevator, which stood where the Bennett elevator now stands. The illustrations show some of the old floating elevators, two or three of the older houses and some of the great modern elevators.



SHOWING THE PRESENT CONDITION OF THE GREAT RETAINING WALL AT THE HEAD OF NO. 2 DRY DOCK.

This reminds me of work later than the Dart elevator—primitive work—where no elevator could be used. In 1852 and 1853 the propeller Charter Oak, Captain Nicholas Gebhart, Clerk William H. Cobb, made a number of trips from Cleveland to Buffalo. In loading at Cleveland several tiers of flour in barrels were placed on the bottom of the hold, then wheat in bulk was poured over the barrels, filling the interstices, then more flour and more wheat until the hold was full. At Buffalo she went to the dock and warehouses of Reynolds & Deshler, central wharf—the building afterward used by the board of trade until 1883. Making fast to the dock, skids were placed to run her flour to the warehouse and outside was a canal boat to receive the wheat. The boats then carrying only about 90 tons—3,000 bushels. Over a hatch was placed a grain hopper of a capacity of about 20 bushels, the hopper having a steelyard beam for weighing the grain. Flour was rolled into the warehouse until some of the wheat could be reached, then the wheat was carried out on the other side and placed in the hopper until no more could be reached, when the process was repeated until the entire cargo was discharged.

JUNIUS S. SMITH.

Buffalo, June 3.

MEAN STAGES OF WATER.

The United States lake survey reports the heights of water in the lakes for the month of May this year, last season, and during the low-water period of 1895, as follows:

Feet above mean tide at New York.

	This year.	Last year.	1895.
Lake Superior..	602.12	602.48	602.38
Lake Michigan.	581.09	581.27	580.13
Lake Huron....	581.06	581.20	580.12
Lake Erie.....	572.85	572.40	571.48
Lake Ontario...	247.04	246.51	244.96

Lake Superior was lower than for any May since 1898, when it was down to 601.70.

Lakes Michigan and Huron were higher than for any May since 1894, except last year.

Lake Erie was nearly half a foot higher than in May last year, and higher than for any May since 1894 except the two years 1903 and 1904.

Lake Ontario was the same height as in May, 1893, and higher than for any May since that time with the single exception of 1904.

The outlook for good draughts is most excellent, as the lakes should go on rising until the middle of July. With Lakes Huron and Erie at a good stage, draughts in the lower Detroit river are sure to be good.

SHORTAGES IN CANADIAN GRAIN CARGOES.

Editor MARINE REVIEW:—Regarding the out-turn of grain cargoes shipped from Fort William and Port Arthur, if the mates of all steamers loading grain at those ports would secure from the government weighmaster the numbers of the different shipping bins into which any part of his cargo had been weighed, and before his steamer would leave the dock see to it personally that there was no grain left in any of those bins, I will venture to say that there will be no large shortage to contend with. It is not the elevator that gains by those shortages but the next vessel to load after the one which has the shortage.

The weighing at Fort William and Port Arthur is all done under the supervision of the government weighmaster, and it is their duty to see to it that the grain after being weighed goes into the shipping bins for which it is intended, therefore there is but one way for those large shortages to occur, and that is for the boat to leave the dock with part of the cargo weighed up for her still in the shipping bin for the next boat loading to get.

Yours truly,

JOSEPH A. BOLAND.

Room 7 and 8, Coal & Iron Exchange, Buffalo, June 10.

A memorial window has been placed in the new First Presbyterian church at Two Harbors, Minn. On the Sunday following the great storm of November 28, 1905, a special service was held in the church and a special invitation was extended to all sailors. At this service the plan was evolved of putting a window in the new church to the memory of the sailors who lost their lives in the storm. The church is just completed and the seamen's window is one of its most attractive features. The window was designed and made by the Pittsburg Plate Glass Co.

The steamer Nyanza, which loaded a cargo of corn at the Wabash elevator at Buffalo, was recently detained in the south branch near Thirty-first street, Chicago. Tugs were unable to pull the deeply-laden vessel through the draw of the railroad bridge at that point. Dredgers were sent for to clear out the draw.

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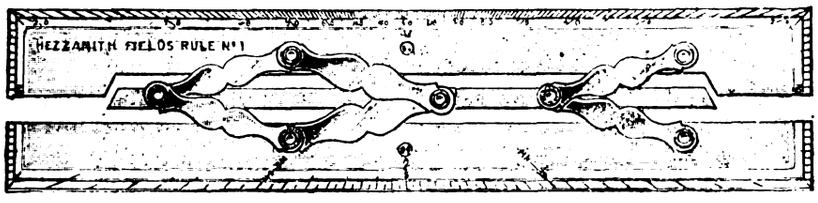
THE GRADUATED PARALLEL-RULER.

The graduated parallel-ruler is being used to some extent by lake masters. It is a good thing and can be worked to a greater advantage on the survey charts (polyconic projection), than on charts of any other projection, including the Mercator projection. This is because of a peculiarity of all lake survey charts. It is a fact that only the central portion of such a chart is perfectly reliable and accurate. The space to be laid down on the polyconic chart is considered to be divided by the latitude parallels into narrow zones, projected according to certain rules on a cone tangent to the zones' lower parallel



(in north latitude the southernmost, in south latitude the northernmost). These zones are then placed so that the middle meridian of each constitutes a common meridian for the whole chart; the zones therefore touch, or are tangent to one another only at points on or near this line and leave an open space between their ends. Now, in order to fill up these open spaces, and make the chart complete, the ends of each zone are stretched, so to speak, so that the lower edge of one zone will coincide with the upper edge of the adjoining zone along the center line. As a consequence of this stretching, it is evident that the parts of the chart near the vertical edges are somewhat distorted. The latitude parallels are not parallel with one another, and the meridians consist of curved lines converging toward the poles, with the exception of the middle meridian, which is a straight line. The central part of this chart satisfies the conditions of conformity, equivalence and equidistance.

The course, or line of bearing, between any two places on such a chart will necessarily be represented by a curved line, if properly laid out. However, if the scale of the chart is large, the bearing may without any practical error be represented by a straight line, and especially so when the two places are situated in the central part of the chart. If the places are widely separated in longitude, it should be borne in mind that when using a straight edge for finding the course between them, the ship following this course will at the end be nearer the elevated pole by a fraction that amounts to about 1½ miles for every hundred. This error is greatly augmented on charts constructed on this projection where the scale is small.

The foregoing facts and conditions may be proven by a close inspection of any lake survey chart, especially those of the open lake on one sheet. Another way of proving it is by laying a parallel-ruler on any printed course on the chart and run it off to one of the chart compass roses. When you get the course according to one rose try it on the next and the next rose. You will find a slight difference in the course on each rose. You will find the greatest difference on the roses lying farthest from your course, while those near the course will give practically the same results. Now, the chart compasses are supposed to all point in the same way, that is, they all coincide with the true meridian. While this is true the meridians situated at some distance from each other cannot show absolutely the same directions for the same straight line at various places on the chart. It is for this reason that the instructions on the chart tell us to use that compass rose that lies about midway between the ends of our course. This helps to even up the course and make the slightly curved line for all practical purposes a straight line.

The object of the graduated rule is to do away entirely with the chart compass rose. The rule is so graduated or marked, that the course is simply read off from the edge of the rule. The beauty of the system lies in the fact that the rule can be read from any meridian; hence, that meridian lying nearest to the middle of the ends of any course can be used. It is not always possible to find a compass rose that will conform to these requirements. The manufacturers of the rule claim that it is easier for one to center the rule to a meridian than to the center of a compass rose.

A graduated rule that is meeting with considerable favor is that manufactured by an English house. Below is printed a cut of this rule. This rule moves in a perfectly straight line over the chart. The hinged attachment only permits the rule to move straight. There is no climbing with this rule as there is with the ordinary parallel-ruler. One edge of the ruler is for laying the course off to degrees, while the other edge is for taking the course off in points and quarter points.

Capt. Wharry, our agent, is taking orders for this rule at the Sault. He has one of them for inspection.

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

FOURTH INSTALLMENT.

37. What are the lights for sailing vessels?

38. Over how many points of the horizon should a side light show?

39. How should side lights be placed?

40. What is an anchor light, and over how many points of the horizon should it show?

41. What are fog signals for steamers?

42. What are fog signals for tow barges?

43. What are the fog signals for sailing vessels?

44. If the wind is NNE and a sailing vessel was heading E½N underway, what signal should she blow in a fog?

45. What is meant by thick weather?

46. If the wind was east and you heard two blasts of a fog whistle on a sailing vessel, how about is said sailing vessel heading?

47. How far should a colored light be seen on a clear dark night?

48. What precaution should be taken in the management of your vessel in thick weather?

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

FIRST INSTALLMENT, PUBLISHED MAY 23 ISSUE.

1. *Answer.*—WNW (west-northwest).

2. *Answer.*—E (east).

3. *Answer.*—ENE (east-northeast).

4. *Answer.*—NW½N (northwest-one-half-north).

5. *Answer.*—8 points.

6. *Answer.*—5 points on the port bow, or more correctly, 3-points forward of the port beam.

7. *Answer.*—S x W (south by west).

8. *Answer.*—SE x S (southeast by south).

9. *Answer.*—There are four 4-point courses, and their names are NE (northeast), SE (southeast), SW (southwest), and NW (northwest). They are called 4-point courses because they are just

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four points from north and from south, which is termed the meridian of the compass; or what is the same thing, these are the points from which all courses are reckoned.

10. *Answer.*—2½ points.

11. *Answer.*—When the wind comes over her starboard side, and her sails belly out to port. A vessel can be on the starboard tack running closehauled or free; but the "rules of the road" consider it thus: A vessel is on either the port or starboard tack when she has the wind forward of abeam, and is running free when the wind bears anything abaft the beam. The fog signals for these conditions being as follows: If on the starboard tack with the wind forward of abeam, one blast of her fog horn; if on the port tack with the wind forward of abeam, two blasts of her fog horn; and when running free with the wind abaft the beam, three blasts of her fog horn. All sailing vessels do not lay as close to the wind when closehauled, consequently the law says anything forward of abeam. This is allowing for anything under 8 points, that is, anything less than 8 points from the direction of the wind. Example, the wind is north, hence a sailing vessel heading on any course between north and west would be on the starboard tack and she would have to blow one blast of her horn in thick weather. Bear this in mind.

12. *Answer.*—The direction of the wind is east, and she will head SE x S on the port tack. To get the direction of the wind from the ship's head by knowing how close she will lay from the wind, count from the ship's head to the right for the starboard tack, and to the left from the ship's head for the port tack. This vessel works in 10 points, that is, five points on either side of the wind. Five points to the right of NE x N is E, and five points to the left of SE x S is E. Knowing how close a vessel will sail from the wind, double this up and count to the right from the ship's head on the starboard tack to get the direction she will head in on the port tack. Hence, in the above example, twice 5 is 10, so that if we count 10 points to the right of the ship's head (NE x N) on the starboard tack it brings us to SE x S. From the port tack to the starboard tack, count to the left from that point of the compass is heading on when on the port tack. Ten points to the left of SE x S brings us to NE x N.

The death is announced of Capt. George McDougall, master of the steamer Athabasca, plying between Fort William and Owen sound. Capt. McDougall was regarded as one of the ablest captains sailing on Lake Superior.

AROUND THE GREAT LAKES.

The D. & C. steamer City of Mackinaw, will go into commission June 15.

The schooner Houghton was damaged to the extent of $2,000 by smashing into the dock at Sarnia.

It is reported that the Grand Trunk railway intends to build another large car ferry slip at Grand Haven.

Sixty-seven electric lights are being installed on posts on piers at the entrance to the Duluth ship canal.

Repairs to the steamer Byron Whitaker following her collision with the steamer John C. Gault will cost about $10,000.

Car ferry Pere Marquette No. 18 has been sold to the Graham & Morton Transportation Co. The ferry is now running between Manitowoc and Ludington.

The new steamer W. B. Davock left the St. Clair yards of the Great Lakes Engineering Works June 10 on her maiden trip bound for Cleveland to load coal.

Capt. Edward Robinson, who for many years commanded the old passenger boats sailing from Sarnia, has been appointed superintendent of the Point Edward elevator.

Col. M. B. Adams has been relieved of charge of the government work at Michican City, Ind., and Col. Wm. H. Bixby, government engineer at Chicago, will hereafter have supervision of it.

Thomas Barlum and others of Detroit have given contract to the American Ship Building Co. for a freighter to come out in 1908, to be 500 ft. long over all, 480-ft. keel, 52-ft. beam, and 30 ft. deep.

The steamer Utica, of the Western Transit Co.'s line, has gone into dry dock at Buffalo for repairs. Several of her plates must be replaced as a result of striking at Horseshoe reef.

The steamer Cartagena, which was sold by Capt. James Davidson, of the Chesebrough Steamship Co., of Boston, is now on her way to the coast, having received her salt water equipment at the Davidson yard.

President James C. Wallace and General Manager Robert Logan, of the American Ship Building Co., are at present making a tour of inspection of the plants operated by the company. They will visit Duluth this week.

The steamer Harvard of the Pittsburg Steamship Co.'s fleet, in passing through the draw of the Cherry street bridge without the aid of a tug, ran on the embankment and blocked traffic across the draw for about two hours. No damage was done.

The steamer Wm. Chisholm, which struck a rock in Sandusky harbor, was docked at Lorain for repairs. It is quite likely that the Chisholm will leave for the coast as soon as she is fitted for salt water service. The deal for her purchase has practically been concluded.

The Lake Erie Dredging Co. was the lowest bidder for removing the shoal just outside the main or north entrance of Buffalo harbor. The Buffalo Dredging Co. was the lowest bidder for dredging about 100,000 cubic yards in front of the Lackawanna and Buffalo & Susquehanna Steel companies.

Vesselmen represent that a winding basin is badly needed at the Way lock, Cuyahoga river, so that boats that trade to the Central Furnace dock can wind. Large carriers are now visiting that plant and they have to be towed down the river stern first, which is always difficult and frequently dangerous.

The bids received by Major Graham D. Fitch, government engineer at Duluth, for placing rip rap on the breakwater at Ashland were as follows: Powell & Mitchell, Marquette, $1.25 per ton; A. Donald & Co., Ashland, $1.17 per ton; Alex. Sand, Duluth, 99 cents per ton; Northern Dredge Co. Duluth, 97 cents per ton.

Groundings in the Cherry street bridge draw at Toledo have been frequent of late. The steam freighter Harvey D. Goulder ran aground in the east channel last week and blocked traffic across the draw for a couple of hours. The Cherry street bridge is practically the only means of communication between the two divisions of the city and any delay is therefore of serious inconvenience to the town.

Thomas S. Christy, who recently died at Detroit, was at one time president of the Hope Transportation Co., Detroit. He was also a member of the old firm of Hodge & Christy, who were widely known as builders of marine engines. Later he became president of the Frontier Iron Works.

NO RATE WAR.

The threatened rate war between the Cunard Steamship Co. and the German lines has blown over and the officials of the Cunard line have announced that the differences regarding the Mediterranean-American traffic, which had arisen from the payment of such large commissions for passengers by the Italian lines, had been settled, and therefore the Cunard line is not to take the initiative in inaugurating a rate war in which the rate of passage was to have been reduced to $15 had not an understanding been reached.

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TREVIRANUS RAPID ORE CAR UNLOADER.

Methods and machinery for the more rapid mining of iron ore have been continually developed during the past 20 years. Railroad transportation has been much improved, and locomotives, cars, and docks have been increased in number, strength, and capacity, but up to this time the first primitive methods of getting the ore out of the cars into the docks by means of hand labor have remained. In short, the entire operation of shipping ore is completely dependent upon what is the most troublesome feature in the working of the dock, namely, labor.

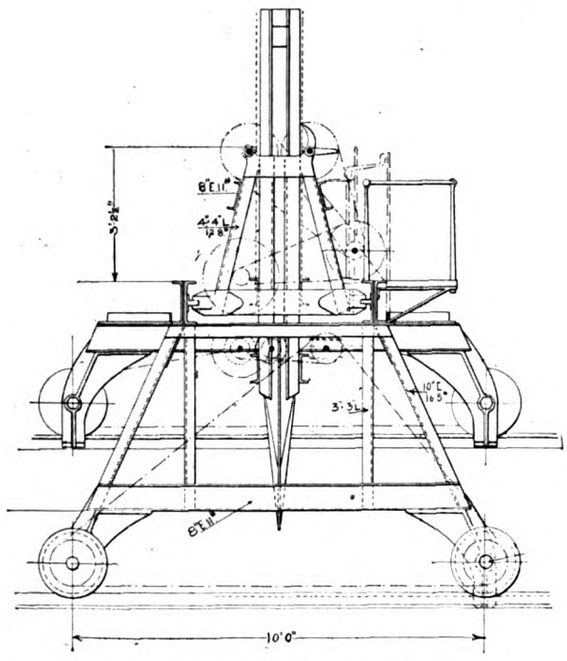

FIG. 1.—END ELEVATION OF ORE CAR UNLOADER.

To supplant this system, the details of which are too well known to need description, Geo. Treviranus, the dock superintendent of the Duluth, Missabe & Northern road, has devised what he styles a "rapid ore car unloader." The apparatus, shown in the accompanying drawings, consists of an overhead traveling bridge similar in idea to the carriage of a gantry crane. This will span the ore pocket from the "gallows frame" to the center of the dock and the runway will extend the length of the dock so that the entire unloading space is accessible. The trucks of the bridge will run on Z-bar rails, laid on the outside of the dock, along the gallows frame and on the inside along a built-up runway so that the only alterations to the present docks necessary for the installation of this machine would be a possible stiffening of the gallows frame and the building of the central runway.

Mounted on this traveling bridge, and operated by means of pinions running on two fixed vertical racks supported by a structural steel framework, are a set of blades which may be raised and lowered, being used as a ram, or by the movement of the bridge along the dock may be used as a sweep. The blades are driven by the connecting mechanism from a motor, and a downward pressure up to eight tons may be exerted by them to break through the ore in the cars as they force it out through the hopper bottoms. The bridge is high enough above the tracks, on which the loaded cars are

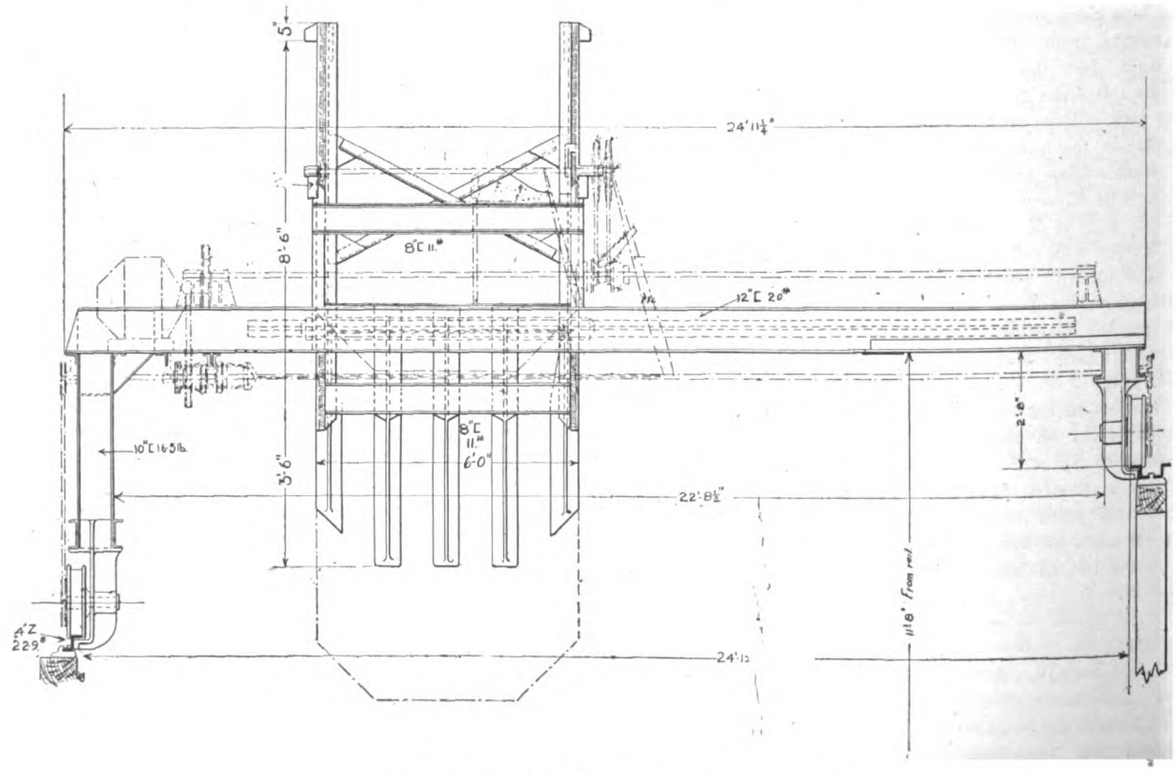

FIG. 2.—SIDE ELEVATION OF ORE CAR UNLOADER.

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spotted over the ore pockets, to clear the cars so that when a train of ore is run on the dock the operator of the unloader moves it over the first car, forces the blades which conform to the cross-section of the car, down through the middle, starting the ore and then, moving the bridge from either end of the car toward the middle, sweeps the remaining ore down through the hoppers. The power available, it is claimed, will enable the blades of the unloader to handle the ore however tightly packed in the cars, and will break up frozen ore in much better shape than is now possible.

With this machine it is estimated that unloading can proceed continuously, rain or shine, at the rate of a car a minute, and instead of the 470 car dumpers employed in two shifts on the docks being required as at present, all that will be necessary will be a single operator for each machine, and the output will be doubled. The unloader is not, as will be seen from the drawings, an expensive piece of apparatus and the cost of installation is small, so that the interest on the investment does not begin to approach the amount which it is claimed would be saved in cost of labor and economy of time through the more continuous and rapid operation. In contrast the work is now frequently interrupted, for a slight rain drives every laborer to shelter, tying up shipping completely, and for work other than during regular hours, the extra time demanded prohibits the operation of the dock for reasons of economy. The installation of the machine unloaders would also make possible a change from the present plan of two 10-hour shifts, whereby four hours are lost every day to three 8-hour shifts.

So far as the efficiency of the new device, and its ability to do the work are concerned, and regarding the necessity for improvement over the methods in vogue, the long experience of the inventor in handling ore should have been a guide sufficient to remove all doubt as to the practicability of the scheme. Labor saving devices are the keynotes of progress and none seem more timely than this one just patented.

Capt. Frank Brown, having piloted the steamer Minnie E. Kelton to Montreal on her way to the Pacific coast, has returned to Milwaukee to take the steamer Lucy Neff to Montreal.

During a fog recently the steamer Veronica and barge Fassett ran on a reef off Rawley's Bay, thirty-five miles north of Sturgeon Bay. The vessels were not seriously damaged.

SAULT STE. MARIE COMMERCE.

The movement of freight through the Sault Ste. Marie canals last month amounts to 7,844,264 tons. The movement of the preceding month was 1,078,613 tons, so that up to June 1 of the present year there has been a total movement of 8,922,877 tons. This is an increase of 1,070,332 tons over the movement to June 1, 1906, so that the commerce of 1907 bids fair to become a record-breaker. Following is the summary:

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

Items	To June 1, 1907.	To June 1, 1906.	To June 1, 1905.
Coal, anthracite, net tons	279,771	101,954	215,128
Coal, bituminous, net tons	1,812,507	1,111,263	843,829
Iron ore, net tons	5,796,767	5,176,649	5,139,574
Wheat, bushels	20,686,212	17,335,905	7,503,863
Flour, barrels	919,685	1,002,240	701,946

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO JUNE 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

Items	To June 1, 1907.	To June 1, 1906.	To June 1, 1905.
Copper, net tons	14,872	23,089	22,005
Grain, bushels	9,123,765	13,072,790	6,451,429
Building stone, net tons			
Flour, barrels	919,685	1,002,240	701,946
Iron ore, net tons	5,496,767	5,176,649	5,139,574
Iron, pig, net tons	1,725	1,821	8,883
Lumber, M. ft. B. M.	103,856	150,587	152,536
Silver ore, net tons			
Wheat, bushels	20,686,212	17,335,905	7,503,863
Unclassified freight, net tons	8,219	33,325	15,312
Passengers, number	903	1,578	1,401

WEST BOUND.

Items	To June 1, 1907.	To June 1, 1906.	To June 1, 1905.
Coal, anthracite, net tons	279,771	101,954	215,128
Coal, bituminous, net tons	1,812,507	1,111,263	843,829
Flour, barrels			
Grain, bushels			
Manufactured iron, net tons	50,576	68,315	23,333
Salt, barrels	113,206	80,853	112,038
Unclassified freight, net tons	147,731	171,791	119,734
Passengers, number	996	2,161	1,388

SUMMARY OF TOTAL FREIGHT MOVEMENT IN TONS.

	To June 1, 1907.	To June 1, 1906.	To June 1, 1905.
East bound freight of all kinds, net tons	6,615,479	6,387,159	5,857,348
West bound freight of all kinds, net tons	2,307,398	1,465,386	1,218,605
Total freight, net tons	8,922,877	7,852,545	7,075,953

Total number of vessel passages to June 1, 1907, was 3,238, and the registered tonnage, 6,878,477.

THE NEW AZIMUTH TABLES.

Captain Henrich's new azimuth table is meeting with much favor with the masters and mates on the lakes, which is just as it should be, for the volume is all, if not more, than what is claimed for it. Capt. Wharry, the MARINE REVIEW'S special agent at the Sault, informs us that he has talked with Captains Carl Secord, Neil Campbell, John Parke, C. J. Grant, J. P. Thompson, and others, relative to the results in working azimuths from the new work, and they are all of the same voice, the results obtained being perfectly reliable and accurate. Any publication that can get the endorsement of such masters as above named needs no further recommendation. They are able men and are the representative masters of some of the largest boats in the world. When the azimuth tables become a little better known there will not be a master or mate on the lakes but will have one, for lake steamboat men are the best in the world and are not slow in getting "next" to a good thing, especially something that is beneficial and helpful to them in fulfilling all the requirements of so important and responsible a calling as theirs. There is probably no other vocation in the business world that requires as much judgment, nerve, intelligence, skill and instinctive knowledge, as that of lake master and pilot.

The Detroit Steamship Co., of Duluth, has been incorporated with capital stock of $150,000 for the purpose of operating vessels on the great lakes. The incorporators are Daniel T. Helm, Ray C. Helm, John C. Overman, Julius H. Barnes and Herbert R. Spencer.

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LAKE VESSELS SOLD SINCE THE FALL OF 1906.

LIST OF LAKE VESSELS SOLD TO AMERICANS.

Str. Alcona, Pittsburg & Erie Coal Co., Erie, Pa.
Str. Alva, Chicago & Duluth Transportation Co., Chicago, Ill.
Str. Arcadia, Capt. Harry May, Cleveland, O.
Sch. Arendal, Capt. Evan Neilson, Muskegon, Mich.
Str. Armour, P. D., Pittsburg & Erie Coal Co., Erie, Pa.
Str. Belle (now Fremont), O. C. Hartman, Duluth, Minn.
Str. Birckhead, H. P., sold to be broken up.
Sch. Blaine, J. G., R. Fitzgerald, Ogdensburg, N. Y.
Tug Brown, Willie, James Davidson, Bay City, Mich.
Sch. Buffalo, Louise A. Pederson, Buffalo, N. Y.
Str. Burnham, George, Naugle Pole & Tie Co., Chicago, Ill.
Str. Business, Pittsburg & Erie Coal Co., Erie, Pa.
Str. Carter, W. J., Churchill Lumber Co., Alpena, Mich.
Bge. Case, J. I., John J. Boland & Co., Buffalo, N. Y.
Str. Chequamagon, Mayor Frederichs, Traverse City, Mich.
Str. Christie, T. S., Herman H. Hettler Lumber Co., Detroit, Mich.
Str. City of Grand Rapids, W. H. Reid, Sarnia, Ont.
Str. Columbia, Arnold Transit Co., Mackinac Island, Mich.
Sch. Commodore, Capt. Frank DeSot, Tonawanda, N. Y.
Str. Conestoga, Crosby Transportation Co., Muskegon, Mich.
Sch. Coyne, Emma L., Richard Harvey et. al., Cleveland, O.
Str. Crescent, Capt. A. C. Majo, Duluth, Minn.
Str. Culligan, Patrick, (formerly George T. Hope), Capt. J. B. Hall, Buffalo, N. Y.
Str. Eastland, Lake Shore Navigation Co., Cleveland, O.
Str. Egan, Wiley M., Pittsburg & Erie Coal Co., Erie, Pa.
Bge. Favorite, Flanner & Reeves, Toledo, O.
Str. Fitzgerald, R. P., Pittsburg & Erie Coal Co., Erie, Pa.
Str. Fitzgerald, William E., S. O. Neff, Milwaukee, Wis.
Sandsucker Fletcher, James Davidson, Bay City, Mich.
Str. Fremont (formerly Belle), O. C. Hartman, Duluth, Minn.
Str. Gault, John C., Capt. M. W. Humphrey, Detroit, Mich.
Str. Gordon, R. J., Capt. S. M. Rose, Manitowoc, Wis.
Sch. Grant Levi, Wilber Anderson, Marinette, Wis.
Str. Gratwick, W. H., Chicago & Duluth Trans. Co., Chicago, Ill.
Sch. Hackley, C. H., Wm Schlosser, Milwaukee, Wis.
Str. Havana, Pittsburg & Erie Coal Co., Erie, Pa.
Str. Hazel, John Deist, Sandusky, O.
Str. Hope, George T., (now Culligan), Capt. J. B. Hall, Buffalo, N. Y.
Str. Hopkins, A. L., Laurence Brown, Chaumont, N. Y., and Capt. Albert Dixon, Cleveland, O.
Str. Huron, Mutual Transit Co., Buffalo, N. Y.
Sch. Hutchinson, Emma C., Capt. William Strong, Tonawanda, N. Y.
Bge. Interlaken, Alex R. Sinclair & Co., Port Huron, Mich.
Str. Iron Age, W. J. Willoughby, Huron, O.
Bge. Iron Cliff, Capt. J. C. Pringle, St. Clair, Mich.
Bge. Jackson, G. K., Mershon, Schuette, Parker & Co., Saginaw, Mich.
Tug Kelderhouse, John, Heckler Dredging Co., Sault Ste. Marie, Mich.
Bge. Kelley, Edward, Pittsburg & Erie Coal Co., Erie, Pa.
Str. Kensington, John J. Boland & Co., Buffalo, N. Y.
Str. Lackawanna, Buffalo Transit Co., Buffalo, N. Y.
Str. Langell Boys, Mershon, Schuette, Pakrer & Co., Saginaw, Mich.
Str. Leighton, Frank C., Albert Dickinson, Chicago, Ill.
Str. McVea, Charles, W. H. Waggoner, Green Bay, Wis.
Str. Maine, S. C. McLouth, Marine City, Mich.
Str. Manchester, Milwaukee-Western Steamship Co., Milwaukee, Wis.
Sch. Marengo, Pittsburg & Erie Coal Co., Erie, Pa.
Str. Marshall, J. D., J. O. Nessen & Co., Manistee, Mich.
Str. Mercur, Fred, John Hall, Ogdensburg, N. Y.
Str. Minneapolis, Mutual Transit Co., Buffalo, N. Y.
Bge. Moore, W. K., Alex. R. Sinclair & Co., Port Huron, Mich.
Tug Mystic, Zenith Dredge Co., Duluth, Minn.
Str. New York, Cedar Point Resort Co., Sandusky, O.
Str. Niagara, J. J. Boland & Co., Buffalo, N. Y.
Str. Ogontz, Capt. J. R. Hilborn, Cheboygan, Mich.
Str. Omaha, S. O. Neff, Milwaukee, Wis.
Str. Oregon, James Squires, St. Clair, Mich.
Sch. Owen, George B., Argo Steamship Co., Cleveland, O.
Tug Owen, John, Frank Perry, Sault Ste. Marie, Mich.
Str. Peters (formerly Jim Sheriffs), J. O. Nessen & Co., Manistee, Mich.
Str. Plankinton, John, Pittsburg & Erie Coal Co., Erie, Pa.
Str. Pringle, John C., Burns Bros., Detroit, Mich.
Bge. Rhodes, D. P., Thomas McGowan, Jr., Detroit, Mich.
Str. Rhodes, Wm. Castle, Mutual Transit Co., Buffalo, N. Y.
Str. Rietz, Charles, M. A. Callahan, Cleveland, O.
Tug Robinson, Duncan, Zenith Dredge Co., Duluth, Minn.
Str. Ryerson, Carry, William Brinen, Muskegon, Mich.
Str. St. Paul, Mutual Transit Co., Buffalo, N. Y.
Str. Sachem, Argo Steamship Co., Cleveland, O.
Str. Sage, Russell, Capt. M. W. Humphrey, Detroit, Mich.
Str. Scranton, Buffalo Transit Co., Buffalo, N. Y.
Bge. Shawnee, Huron & Erie Transportation Co., Detroit, Mich.
Str. Sheriffs, Jim (now Peters), J. O. Nessen & Co., Manistee, Mich.
Str. Shrigley, James H., Huron & Erie Tranportation Co., Detroit, Mich.
Str. Soper, Albert, Flanner & Reeves, Toledo, O.
Str. Soo City, Indiana Transportation Co., Chicago, Ill.
Sch. Stafford, Wm Schlosser, Milwaukee, Wis.
Sch. Sweetheart, James O'Connor, Tonawanda, N. Y.
Bge. Tempest No. 2, Riley Burlington, Bay City, Mich.
Bge. Tilden, S. J., Edward Hines Lumber Co., Chicago, Ill.
Str. Tuttle, H. B., Capt. Harris W. Baker, Detroit, Mich.
Bge. Tyson, E. E., S. C. McLouth, Marine City, Mich.
Tug Uranick, Muir Bros. & O'Sullivan Co., ———
Sch. Uranus, S. C. McLouth, Marine City, Mich.
Str. Vail, Walter, J. A. Calbick & Co., Chicago, Ill.
Str. Walsh, Lizzie, J. O. Nessen & Co., Manistee, Mich.
Str. Wyoming, Wyoming Steamship Co., Buffalo, N. Y.

LIST OF LAKE VESSELS SOLD TO CANADIANS.

Sch. Aberdeen, William Hackett & Sons, Quebec, Que.
Str. Alaska, J. E. Williscroft, & W. J. Pulling, Windsor, Ont.
Sch. Beals, E. P., Adolf Lomer, Montreal, Que.
Str. Benton, F. W. Doty, Goderich, Ont.
Str. City of Ottawa (formerly India), Montreal & Lake Erie S. S. Co., Ltd., Montreal, Que.
Str. Cuba (now Ionic), Northern Navigation Co., of Ontario, Ltd., Collingwood, Can.
Str. Curlew, George H. Finniout, Port Arthur, Ont.
Str. Fisk, Edmund, Great Lakes Dredging Co., Port Arthur, Ont.
Str. India (now City of Ottawa), Montreal & Lake Erie S. S. Co., Ltd., Montreal, Que.
Str. Ionic (formerly Cuba), Northern Navigation Co., of Ontario, Ltd., Collingwood, Ont.
Tug Jean, Port Burwell Fishing Co., Port Burwell, Ont.
Sch. Kitchen, J. B., ———
Port Hope, Ont.
Bge. Minch, Sophia, Capt. W. J. Colwill, Sarnia, Ont.
Str. Richards, Rube, F. W. Doty, Goderich, Ont.
Str. Rosedale, R. O. & A. B. Mackay, Hamilton, Can.
Str. Scott, Thomas R., Peninsular Tug & Towing Co., Wiarton, Ont.
Bge. Superior, James Whalen, Port Arthur, Ont.
Sch. Warmington, G. H., F. C. Hall, Trenton, Ont.
Str. Williams, Eliza, James Whalen, Port Arthur, Ont.
Str. Wissahickon, Capt. William Carmichael, Collingwood, Ont.
Str. Witherbee, J. G., Bernard J. Kaine, Quebec, Que.
Barge No. 7, James Whalen, Port Arthur, Ont.
Scow B-9, James Whalen, Port Arthur, Ont.
Scow B-11, James Whalen, Port Arthur, Ont.
Scow B-12, James Whalen, Port Arthur, Ont.

LIST OF CANADIAN VESSELS SOLD.

City of Windsor, Northern Navigation Co., of Ontario, Ltd., Collingwood, Can.
Str. Cuba, Northern Nav. Co., Collingwood, Ont.
Bge. Cyrenian, Sarnia Transportation Co., Sarnia, Ont.
Doric (formerly Tadousac), Northern Navigation Co., of Ontario, Ltd., Collingwood, Ont.
Tug Menodora, Canadian Dredge & Construction Co., Midland, Ont.
Tug Minitaga, Great Lakes Dredging Co., Port Arthur, Ont.
Bge. Naiad, Sarnia Transportation Co., Sarnia, Ont.
Tadousac (now Doric), Northern Navigation Co., of Ontario, Ltd., Collingwood, Ont.
Str. Where Now, Deseronto Nav. Co., Ltd., Deseronto, Ont.

LIST OF LAKE VESSELS SOLD TO PACIFIC COAST.

Str. Chippewa, Puget Sound Navigation Co., Seattle, Wash.
Str. Curtis, C. F., Miami Lumber Co., San Francisco, Cal.
Str. Devereaux, J. H., Capt. Whiteside, San Francisco, Cal.
Sch. Goodman, W. O., ———
Str Howard, John C., Dollar Steamship Co., San Francisco, Cal.
Str. Iroquois, Puget Sound Navigation Co., Seattle, Wash.
Str. Kelton, Minnie E., Miami Lumber Co., San Francisco, Cal.
Str. Lindsay, A. G., Arthur Rupert, Aberdeen, Wash.
Str. Neff, Lucy, Miami Lumber Co., San Francisco, Cal.
Str. Winnebago, Coast Shipping Co., San Francisco, Cal.

LIST OF LAKE VESSELS SOLD TO ATLANTIC COAST.

Bge. Baden, Boutell Steel Barge Co., Boston, Mass.
Bge. Badger, Boutell Steel Barge Co., Boston, Mass.
Bge. Baravia, Boutell Steel Barge Co., Boston, Mass.
Bge. Baroness, Boutell Steel Barge Co., Boston, Mass.
Str. Bay City, Boutell Steel Barge Co., Boston, Mass.
Str. Bay Port, Boutell Steel Barge Co., Boston, Mass.
Str. Bay State, Boutell Steel Barge Co., Boston, Mass.
Str. Bay View, Boutell Steel Barge Co., Boston, Mass.
Bge. Berkshire, Boutell Steel Barge Co., Boston, Mass.
Bge. Bombay, Boutell Steel Barge Co., Boston, Mass.
Bge. Brittania, Boutell Steel Barge Co., Boston Mass.
Str. Carpenter, O. O., W. H. Brigham, Boston, Mass.
Str. Cartagena, F. B. Chesbrough, Boston, Mass.
Str. Duncan, Maggie, W. H. Brigham, Boston, Mass.
Str. Katahdin, Export Lumber Co., New York City.
Str. Madagascar (now Kennosha), F. B. Chesbrough, Boston, Mass.
Sch. Slauson, Minnie, I. H. Morehouse, Hampden Corner, Me.
Str. Chisholm, William, Seaboard Transportation Co., New York.
Str. Ravenscraig, Atlantic Coast interests.

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NEW STEAMER MASSACHUSETTS.

The new steamer Massachusetts the first of the three freight steamers constructed by the Quintard Iron Works Co., of New York, and the William Cramp & Sons Ship & Engine Building Co., of Philadelphia, from lines made by J. Howland Gardner, superintendent of marine construction, and his assistant W. S. Rogers, for what is now known as the New England Steamship Co., a subsidiary company of the New York, New Haven & Hartford Railroad Co., made a trial trip from New York to Fall River on Tuesday, June 4, 1907, and succeeded in breaking all records down the sound.

When the contract was made for these steamers, Mr. Stevenson Taylor, of the Quintard Iron Work Co., promised Mr. Mellen, president of the New York, New Haven & Hartford Railroad Co., that they would carry 720 tons of freight on the main deck, that the propelling machinery would develop 7,000 H. P., and that the steamers would make a speed of 18 knots.

On this trial trip the Massachusetts, with a load of 800 tons on board, more than fulfilled, in every respect, all of the promises made. The Massachusetts left Pier 18, North river, at 3:12 p. m. and engines were stopped off the company's pier in Fall river at 11:00 p. m., thus making the run from dock to dock in 7 hours and 48 minutes, an average of 23 statute miles per hour, or 20 knots.

It has always been claimed that the steamer Metropolis, many years ago, made the run from Pier 3, North river, New York, to Fall river, in 8 hours and 42 minutes.

The steamer Puritan, on June 8, 1899, made the run from the dry dock, at the foot of Pike street, East river, New York, to Fall river, in 8 hours and 24 minutes, which fully equalled the claimed record of the steamer Metropolis.

The steamer Priscilla has never had the opportunity of making an especial fast run all the way from dock to dock, New York to Fall river, though she has made better time than the steamer Puritan between intermediate points.

The steamer Massachusetts, like all the large steamers of the present time, and differing from the days of steamer Metropolis, was compelled to run slow through the North and East rivers all of the way to Throggs Neck, and, of course, through the shoal water of Mount Hope bay, approaching Fall river, was also compelled to go slow, drawing as she did, 15 ft. of water.

Nevertheless, the record of the Massachusetts beats all other records from dock to dock, at least 54 minutes.

The steamer Puritan, on May 26, 1893, the day on which she went out to try her speed alongside of the Richard Peck, made the run from Stratford to Point Judith, a distance of 87¼ statute miles, in four hours and two minutes. The Massachusetts made this same run in three hours, 34 minutes and nine seconds.

The steamer Priscilla, on July 21, 1894, when trying conclusions with the steamer City of Lowell, made the run from Throggs Neck to Little Gull, a distance of 95 miles in four hours and 30 minutes. The Massachusetts made this same run in four hours and three minutes.

Of course, all runs of this character, are made with the tide more or less favorable, but to determine the actual speed through the water of the steamer Massachusetts, her run from Execution to Point Judith, was used. This run measured as close as possible for a steamer to make is 122½ statute miles, or, 106.4 nautical miles.

The Massachusetts made this run in five hours, eight minutes and 29 seconds, which gives a mean speed of 23.82 statute miles per hour, or, 20.67 knots; making an allowance of 1½ knots for the tide which, under the circumstances, is considered liberal, gives a speed through the water, of the Massachusetts of 19.17 knots.

The engines were designed for 125 maximum revolutions per minute, but on this run they averaged 133 for both engines, developing over 9,000 H. P.

The representatives of the various interests on board were as follows: Capt. J. W. Miller, vice president; Capt. H. O. Hickerson, general superintendent; Mr. J. Howland Gardner, superintendent of marine construction; Mr. William S. Rogers, assistant superintendent; all representing the New England Steamship Co.

Mr. Nicholas F. Palmer, president; Mr. Stevenson Taylor, vice president; Wr. Warren T. Berry, general superintendent; from the Quintard Iron Works Co.

Mr. Carroll S. Smith, and Mr. Stockman, representing the Cramps' company. To say that everybody was immensely pleased with the performance is to speak very mildly. All were satisfied and called the steamer a perfect success.

NEW MARITIME EXCHANGE COMMITTEES.

The following committees, recently appointed, have just been posted at the New York Maritime Exchange. They will serve until June, 1908:

Executive—Charles R. Norman, J. Raymond Smith, Wm. D. Dickey.

Floor—William H. R. Killeen, C. H. Callaghan, Frederick P. Nichols, Frederick Bolander, John J. Hinchman.

House—G. B. Lockhart, W. Freeland Dalzell, J. Fred Lohman.

Arbitration—C. B. Parsons, Henry J. Kimhardt, John V. Barnes, Hugh Kelly, Wm. H. Withey Jr., Anton A. Raven, Geo. T. Hay, Thomas Corner, Daniel C. Chase, A. W. Smith.

Railroad Cross-Ties—Jas. E. Brodhead, George S. Baxter, Wm. P. Cook, Simon H. Brown, Warren E. Gates.

Finance—McDougall Hawkes, E. Clifford Weeks, Franklin D. Mooney.

Complaint—Alfred D. Snow, David B. Dearborn, Max M. Norman, Frederick E. Scammell, Arthur M. Smith.

Supply—Edward H. Loud, Wm. Boyd, Wm. E. Cleary.

Southern Pine Trade—Frank B. Haviland, Joseph H. Eckstein, Charles S. Langdon, John M. Bond.

Arbitration on Delivery and Receipt of Southern Pine—F. V. L. Jones, A. C. Puddington, Jesse J. Eppinger, C. W. Chadwick, Robert R. Sizer.

Public Piers—C. H. Callaghan, Wm. H. R. Killeen, A. W. Smith, R. G. Moran, John C. Gregory.

Admission—Wm. L. Gerrish, Selah H. Cornish, Andrew M. Campbell, George E. Winter, Amos D. Carver.

Law—E. Clifford Weekes, Edward H. Loud, J. Frank Dunham.

Steamship Affairs—Gustav H. Schwab, Ernest C. Bliss, A. Emelius Outerbridge, Edward F. Geer, George S. Dearborn.

Maritime Affairs — Archibald H. Bull, A. J. Newbury, Joel W. Brown, Melbourn P. Smith, Edward Cole.

Lighterage—Wm. E. Cleary, John Tracy, Marcus H. Tracy, Henry M. Lee.

Arbitration on Railroad Cross-Ties—Frederick Bolander, James E. Brodhead, George A. Tooker, Andrew J. Bailey, Richard D. Wrigley.

Capt. Mulcahey, of the British steamer Eretria, which was unloading ore at the Pennsylvania Steel Co.'s wharf at Chester, Pa., during the past week, had with him his eighteen months old son who has completed his seventeenth trip across the ocean. It is believed that he is the youngest person who has ever made so many voyages between the two continents.

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QUESTIONS ANSWERED.

Ques.—If a sailing vessel lays 5 points from the wind running close-hauled and the wind is NE by E, how will she head on the starboard tack, and also on the port tack? *Ans.*—North on the starboard tack, and ESE on the port tack.

Ques.—If a vessel lays 4¾ points from the wind closehauled and heads SW½S on the port tack, what is the direction of the wind and how will she head close-hauled on the starboard tack? *Ans.*—Wind is S by E¼E; will head ESE on starboard tack closehauled.

Ques.—If a sailing vessel heads NE by E closehauled on the port tack and WNW closehauled on the starboard tack, what is the direction of the wind and how close does she lay to the wind? *Ans.*—Wind is N½W; sails 5½ points from the wind.

Ques.—Why is it that a vessel is on the starboard tack when the wind comes over the starboard side? I should think it would be just the other way, that is, because she would lay on her starboard side? *Ans.*—Tack originated from the tack of sail. The tack of a sail is the extreme lower forward corner of any sail. In order to trim this portion of the sail the tack of the sail must be pulled taut on the windward side, and from this circumstance the tack the ship was on depended on which side the tack was on, and since the tack of the sail was always on the windward side, that side of the ship the tack was drawn on was called the tack the ship was on.

Ques.—In the yawl-boat problem, why do they multiply by .6 and divide by 10? *Ans.*—Multiplying by .6 is the same thing as deducting .4 from the whole. Multiplying the length, breadth and depth of your boat makes an oblong figure of it with square corners and sides. The .6 or .4 off is to allow for the round of the bottom, the pointed stem, etc. The pointed stem, round of the bottom, etc., is figured as being .4 of what an oblong figure would be having the same length, breadth and depth. Divide by 10 because each person, according to law, is allowed a space of 10 cubic feet.

Ques.—How do you determine the number of persons a life-boat is allowed to carry from the figures painted on the stem of it? *Ans.*—Divide the number by 10.

Ques.—What are the following correct magnetic bearings of these ranges in the Soo river: Winter Pt. Range with Mud Lake Beacon? (*Ans.*—NW); Vidal Shoal Channel range (*Ans.*—W by S); Pt. au Pins Range (*Ans.*—SW by W.).

Ques.—If my compass should read NW⅝W on Winter Pt. range, how much and which way is the deviation? *Ans.*—⅝-pt. Ely.

Ques.—Which is the red magnetic pole of the earth, and which is the blue pole? *Ans.*—The south magnetic pole of the earth is the red pole, because it contains north magnetism, or the same kind as in the north end of the compass magnet; and the north magnetic pole the blue or south kind of magnetism.

Ques.—What is the cause of the variation of the compass? *Ans.*—Simply because the magnetic poles of the earth do not coincide with the poles of the axis on which the earth revolves. All directions in the first place are taken from the true poles of the earth. If the compass pointed to the true pole instead of the magnetic pole, the compass would show true directions instead of magnetic directions, and the true course would not have to be corrected for the variation. The needle in pointing to the magnetic pole makes an angle with the direction of the true pole and this difference is the variation of the compass.

Ques.—What is a simple way of getting the distance off a course for different angles, such as if the true course was N by E½E, and the Var. ¼-pt. Wly., and I did not allow for it, how far would I be from the true course on a run of, say, 75 miles? *Ans.*—Multiply the distance by .2 and this will give it to you for 1 compass point; divide by 4 for ¼-point. Thus, 75 × .2 equals 15, that is, 15 miles off for one point; ¼ of 15 is 3¾, or 3¾ miles off for ¼-point on 75 miles. .2 makes the distance a trifle greater than it is, but it is near enough in all practical work.

Ques.—How should knot and nautical mile be used? What is the correct definition of these words and how are they intended to be used? Can they be used indifferently to mean the same thing? They are of the same length? *Ans.*—The knot relates to speed only, and the nautical mile to distance, though nautical mile can be used in defining speed. When knots are used speed is meant and not distance. To restrict knot to its legitimate meaning, and this is highly proper, it should be defined as "nautical mile per hour." It is a measure of speed only. Knot may be defined as rate of speed measured in terms of nautical miles per hour, one knot being equivalent to one nautical mile in an hour. Since knot means speed per hour, it is only necessary to say so many knots, and it is once understood that the vessel's speed is that number of nautical miles per hour. The ship's speed was 18 knots, means 18 nautical miles per hour. It is not necessary to say "per hour" with knots, because knots mean so many nautical miles in an hour. Instead of saying "the distance is 120 nautical miles, and the ship's speed is 20 nautical miles an hour" we should say "120 nautical miles at 20 knots." This covers the point since knots means the distance the ship runs in nautical miles per hour.

Ques.—How should the North Star bear by a compass that is free from deviation at Duluth, the Soo, Straits of Mackinaw and at Buffalo? If the North Star bore North by compass at Duluth, would not my compass be correct? *Ans.*—The Var. at Duluth is about 8° Ely, equal to ¾-pt., hence, the correct magnetic bearing of the North Star at Duluth is N¾W. If your compass was free from deviation on north the star should bear by it N¾W. The Var. at the Soo is about ¼-pt. Wly., hence the correct magnetic bearing of the North Star there would be N¼E. In the Straits of Mackinaw where the variation is practically nothing the correct magnetic bearing would be also the true bearing, that is, North. At Buffalo the Var. is about 6½° Wly., hence the correct magnetic bearing is N 6½° E, or N⅝E. If the North Star bore north by compass at Duluth, its deviation would be ¾-pt. Ely.

Ques.—What difference is there between a gross ton and a net ton when used to designate the tonnage of a vessel, such as her gross tonnage is 650 and her net tonnage is 600. Does the number of pounds in a gross or long ton and a net short ton have anything to do with it? *Ans.*—The registered ton as applied to a ship's tonnage is equivalent to a space of 100 cubic feet. A ship's gross and net ton is the same thing as to the number of cubic feet. The gross tonnage of a vessel is the entire cubical measurement or contents below decks, or the whole of the ship's hold, each space of 100 cubic feet being called a ton. The net tonnage of a ship is the gross tonnage minus the space taken up by the boilers and engines, etc., figured in spaces of 100 cubic feet, and deducted from the number of gross tons. The net tonnage means the space in the hold available for cargo. The long and short ton have nothing to do with it. Different kinds of cargo are weighed according to the long and short ton. The gross tonnage of a boat does not indicate that this is her carrying capacity in gross tons, and the same with the net tonnage. Some kinds of cargo only run 40 cubic feet to the ton. Coal for instance, runs about 40 cubic feet to the ton, so that the registered ton occupying a space of 100 cubic feet would accommodate 2½ tons; hence, a ship's net tonnage does not indicate her carrying capacity. There are other kinds of cargo that will run from 100 to 150 cubic feet to the ton, such as bulky merchandise, crated products, etc. The long ton, sometimes referred to as the gross ton, is equal to a weight of 2,240 pounds. A short ton, referred to as a net ton, is equal to a weight of 2,000 pounds. The carrying capacity of a ves-

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sel is actually equivalent to the difference between the weight of the water displaced by the vessel when light, and that displaced by her when loaded to the greatest safe depth of immersion. The ton measurement upon which freight is charged is calculated at 40 cubic feet; the difference between that and the ton of 100 cubic feet, represents the dead weight or displacement of the ship when light, or 60 per cent of the whole, 40 per cent only being available floating power for cargo.

Ques.—What is meant by the lee shore. Is it not the shore under which you make a lee? *Ans.*—A reference to any dictionary would tell you at once. A lee shore is that shore on which the wind blows and on which the sea breaks with its greatest force. The weather shore is that shore from whence the wind and weather comes. To make a lee we get up under a weather shore. There are many people who get the lee shore mixed up with the weather shore on account of in making a lee it is necessary to take the weather shore in order to do so. To the novice the weather shore is the shore on which the wind blows and the lee shore the shore the wind comes from. Windward and weather are synonymous, meaning that point of the compass from which the wind blows. The weather shore is the shore to windward; the lee shore the shore to leeward, or on the lee side of the boat.

Ques.—I am in a sailing vessel; and the true course to my destination is NE, and the wind is NE. I put her as close to the wind as she will sail and make progress; now, what I want to know is, why do I have to allow easterly Var. and Dev. to the right and westerly Var and Dev. to the left of the course by compass in order to get the true course on the chart the vessel has made? Why can't I correct my course in the first place and allow Ely. Var. and Dev. to the left of the true course and Wly. Var. and Dev. to the right? *Ans.*—The course of a vessel beating to windward is governed by the wind. You cannot tell what your compass course is going to be till you have placed your vessel in position to take the wind to the best possible advantage. You know that Ely. Var. and Dev. mean a swing of the compass card to the right, and Wly. Var. and Dev. a swing of the card to the left, and since the vessel's head follows the card, her course must be influenced by these corrections in the same way. With Ely. Var. or Dev. the true course must be to the right of the course as indicated by the compass, so that to get the true direction the ship has gone or is going over the ground, you must allow the amount of your correction to the right of the course as shown by compass. With Wly. Var. and Dev. the true course corresponding to the compass course lies on the left hand side of the compass course. When the Var. and Dev. are not allowed for the true direction the ship is going in is either to the right or to the left of the course as shown by the compass. If the compass course is NE with ¼-pt. Ely. Var. and ½-pt. Ely. Dev., the true course the ship has made over the ground is NE¾E, because the card is swung to the right ¾-pt. of what a true compass would indicate; hence, in steering the course NE by compass with the card turned aside ¾-pt. NE is where NE¾E should be. If it were desired to steer NE true in the first place and the ship's head was not guided by the wind, then all that would be necessary would be to allow the opposite way from what Ely. and Wly. mean. Thus, to make a true course of NE with ¾-pt. Ely. correction, we apply it to the left of the true course because if it was not allowed for we know it would carry us to the right of the course steered by compass. To be able to apply the Var. and Dev. in the first instance the ship must be able to go in any direction, against the wind as well as with the wind. The course of a vessel beating to windward is guided by the direction of the wind, hence to know the true direction the ship is making good it becomes necessary first to establish the compass course, and as I said before, the compass course is controlled by the direction of the wind. A sailing vessel with a fair wind can always steer a compass course that corresponds to the true course desired to be made good.

Ques.—What is meant by the smooth of the sea, and what is its cause? *Ans.*—During heavy gales, when very high seas are running, or even in a moderate gale of wind, it will be observed that at intervals of every few minutes a lull in the sea takes place, that is, the sea is not so high nor violent. This lull is what is called a smooth. These smooths or lulls occur after the three or four largest seas, which occur in groups, have passed. Vessels bucking into a heavy sea and then desiring to come round and run with it, or vice versa, that is, after having run with it and now desire to run into it, wait for one of these smooths, and when it comes starboard the helm and come round as quickly as possible before the next group of heavy seas break and have an opportunity of catching the vessel in the trough of the sea. This is a much easier and safer manner than maneuvering the vessel so as to encounter the full force of the trough. The lulls that take place in relation to the sea also take place in relation to the wind. The grouping together of these larger waves than the general run is caused by the exceptional force of the squalls which occur at intervals in nearly every gale of wind.

Ques.—What is heave of the sea, and when do you have to figure for it? *Ans.*—When a vessel is steering or running more or less in the trough of a heavy sea, the effect is to drive her to leeward, and this is expressed either as the heave of the sea or the send of the sea. It goes without saying that a shallow vessel will be lifted off more than a deep vessel, and for this reason no rule can be given, the master being obliged from experience to estimate the quantity for his vessel. It would be allowed for in the same way as leeway.

Ques.—What is meant by the expression "ship's displacement," and how is it determined? *Ans.*—The displacement of a ship is the volume of that portion of her hull that is immersed or below the surface of the water, or which has displaced an equal volume and now occupies its place. Displacement is properly expressed in cubic feet, giving the measure of the place or hole-in-the-water filled by the ship. As the weight of the vessel as she swims is exactly the weight of the water displaced, it is convenient to express the displacement as so many tons, meaning tons of water at so many cubic feet to the ton. About 35 cubic feet of ordinary sea water weighs 2,240 pounds, or a long ton. This is on a basis of 64 pounds to the cubic foot. A cubic foot of fresh water weighs about 62.3 pounds, or about 36 cubic feet to the long ton. When we say that a vessel's displacement is 5,000 tons, it means that her hull shoves aside enough water so that if it could be weighed it would amount to 5,000 tons. Any floating substance or object will displace its own weight in the water, hence if its weight be known the amount of water displaced will be equal to this weight. A substance that will not float will displace its own volume. Knowing the volume we can easily determine the weight or cubic measure of the water displaced; and similarly, if we do not know the volume we can ascertain it by weighing or measuring the amount of water displaced. Water has a buoying effect or pressure and its floating power is equal to its own weight; that is, a cubic foot of fresh water will buoy up a weight of 62.3 pounds, while a cubic foot of sea water will buoy up 64 pounds. This, of course, means any substance whose specific gravity is less than that of water, or any substance if it be so shaped that it is capable of floating, such as an iron kettle, etc. If that portion of a ship's hull immersed measures 200,000 cubic feet her displacement in fresh water would be equal to as many tons as 36 is contained times in 200,000, or 5,555.5 tons, and this would also equal her weight. To displace an equal amount

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of sea water the hull would have to be considerable deeper in the water, since sea water has greater density, and therefore, has greater buoyancy. To determine the approximate displacement of a vessel figure the number of cubic feet of that portion of the hull immersed. To do this, simply take the mean of her depth for'ard and aft, and with her average length and beam (what would be equal to an oblong figure with square ends and sides) multiply these three terms together, and divide as above.

GENERAL RULES AFFECTING LIABILITY FOR INJURIES BY VESSELS.

The one who sets up the defense of inevitable accident has the burden of showing that everything was done which could and ought to have been done to avoid the collision. But a prima facie case of negligence and want of due seamanship must first be shown. In the following cases it was held that the collision was not an inevitable accident between steam vessels navigating in a dense fog under circumstances shown to be of great danger where they failed to come to a standstill by a timely reversing; between vessels going too fast in a fog; between a tug running at a speed of eight miles an hour in a fog and one of the vessels in a large tow, whose tug was sighted at a distance of from 30 to 60 yards; between a drifting schooner and a tow where the schooner might have dropped her anchor; between a vessel moored at a wharf and another attempting to land in a high wind; between a vessel at anchor and a steamboat whose stem was slewed around or running into a well known eddy; in the case of a steamship whose patented steam steering gear suddenly failed to act, it having also refused to act a few days previously; in the case of a vessel which started out during a high wind which prevented her from being properly steered; where a vessel dragging her anchor might have slipped her anchor and set sail.

The duty to stand by after collision to render such assistance as may be necessary, enforced by the early maritime decisions, is now enforced by statute. But these statutes do not make absolutely liable for the collision the vessel which, without sufficient excuse, fails to stand by, but merely put upon her the burden of showing that she was not responsible for the collision. And where the facts of the collision being shown, it does not appear that such vessel was in fault, and it does appear that the other vessel was guilty of a fault sufficient to account for the collision, the former cannot be found guilty of contributory fault, merely because of her failure to stand by. But a vessel has been held liable for a loss after collision caused by her inexcusable failure to render assistance. The vessel is, however, excused from the duty to stand by where it is apparent that her assistance is not necessary, as where the vessel was near land. But it is no excuse that the crash was slight, or that the injured vessel did not call for assistance, or that other vessels were lying near by at anchor. So, also, the master is excused from standing by where his own vessel would be endangered thereby.

(Concluded.)

NEW ALLAN LINER CORSICAN.

The twin-screw steamer Corsican, the first of three vessels which are at present being built on the Clyde to the order of the Allan Line Steamship Co., Ltd., was launched from the shipyard of Barclay, Curle & Co., Ltd., Whiteinch, on the 29th ult. As far back as 1861 the Whiteinch firm—but in their old works at Finnieston—launched for the Allan fleet the steamer St. Andrew, since which date it has constructed upwards of a dozen vessels—both sailing and steam—to the same account. The Corsican is intended for the Liverpool-Canadian service, and is 516 ft. long, 61 ft. 3 in. beam, and 42 ft. 9 in. deep from bottom of keel to top of deck at center. In tonnage she will measure 12,000 tons gross, and her builders will fit her with triple-expansion engines of about 8,500 indicated horsepower, designed to give her a speed at sea of 16 knots. In her construction the vessel not only conforms to the highest class in the British Corporation Register of Shipping, but possesses also considerable additional strengthening in order to meet the owners' special requirements in the North Atlantic service. The hull is divided into separate water-tight compartments by seven bulkheads, in addition to which a complete inner bottom is fitted, minutely sub-divided into separate ballast tanks, having arrangements for filling and emptying each tank independently, so that the draught and trim of the vessel can be adjusted at any time to suit the conditions of service. There are four complete steel decks—orlop, lower, main, and shelter—and at the after end there is a long combined poop and bridge, sheathed with pitch pine, forming a promenade, which is assigned partly to second-class passengers and partly to third-class. Above this is the promenade deck, which is reserved exclusively for first-class passengers; and above this, again, is the upper bridge deck, on which are arranged the officers' quarters and the flying bridge for navigation purposes. Accommodation is provided for 300 first-class, 400 second-class, and 1,500 third-class passengers. The first-class dining saloon is situated in the deck-house at the fore end of the bridge deck, and extends right across, being lighted by large square windows on three sides. Other features of note in the first-class accommodation are music room, grand staircase, smoking room, etc., all being well designed, well lighted and ventilated. The second-class passengers are provided for in a style differing but little from the first-class, and the accommodation for 1,500 third-class passengers is on a scale at least equal to that on any other steamships in the same service.

The machinery of the Corsican consists of two sets of triple-expansion engines, with cylinders 28 in., 47 in., and 79 in. diameter by 54 in. stroke. Piston valves are fitted to the high-pressure and flat slide valves to the intermediate and low-pressure cylinders. Direct steam starting and reversing gear is fited, as are also steam and hand gear for turning the engines in port. While the designed sea speed is 16 knots, it is estimated that the machinery is of such power as to give the vessel on trial a speed of at least 17 knots. A full outfit of auxiliary and deck machinery for steering the vessel, working anchors and cargo, etc., is, of course, installed. The naming ceremony, on the 29th ult., was performed by Miss Nita Allan, daughter of Mr. Bryce Allan, of Wemyss Bay. The new vessel is due to proceed on July 11th on her maiden voyage to Quebec and Montreal.

Nearly eighty years old, the sloop-of-war St. Louis has been sold by the government to a junk dealer of Philadelphia for $4,210. She was condemned by a board of surveyors at League Island navy yard and her upset price was fixed at $3,300. The copper in her hulk, however, made her more than usually valuable. She was built at Washington in 1828 and was the vessel with which Capt. Ingraham overawed a Hungarian squadron in the harbor of Smyrna. An American citizen was held prisoner on the Hungarian flagship. Capt. Ingraham cleared for action and served notice that he would sink the entire Hungarian fleet unless the prisoner was released up to a certain hour. When the hour came the prisoner was safely aboard the St. Louis.

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VESSEL ACCIDENTS OF A MONTH.

Date.	Name of Vessel.	Nature of Accident.	Place.
May 5	Str. Turret Court	Damaged slightly by ice.	Fort William, Ont.
May 5	Str. Harry Coulby	Damaged by ice.	Fort William, Ont.
May 6	Str. Arabian	Slightly damaged by fire.	Fort William, Ont.
May 6	Shenandoah	Broke towing machine.	Near Marquette, Mich.
May 6	Str. Sanilac	Got line in wheel.	Grand Marais, Mich.
May 9	Str. David W. Rust	Ran aground; released.	Peche Island.
May 9	Str. John Oades	Ran aground; released without damage.	Wyandotte, Mich.
May 9	Str. Iron Age	Broke rudder.	Detroit, Mich.
May 9	Str. Western Star	Ran aground.	Detroit river.
May 10	Str. Philip Minch	Ran aground; released without injury.	Lime Kilns Crossing.
May 10	Tug George D. Morrison	Broke rudder.	Near Sarnia.
May 11	Sch. S. B. Pomeroy	Sank, owing to defective pumps.	Lorain, O.
May 12	Str. Byron Whittaker	Collided with Str. J. C. Gault; sank.	Detroit river.
May 12	Str. J. C. Gault	Collided with Str. Byron Whitaker; uninjured.	Detroit river.
May 12	Str. Mecosta	Broke air pump.	Sault Ste. Marie, Mich.
May 12	Bge. Melvina	Sprung leak; had to be unloaded.	Near Port Huron.
May 12	Sch. A. J. McBrier	Destroyed by fire.	Near Drummond Island, Lake Huron.
May 14	Str. City of Mt. Clemens	Ran on rock; beached; pumped out.	Sandusky Harbor.
May 14	Str. Augustus B. Wolvin	Caught fire; slightly damaged.	Lake Erie.
May 14	Sch. Plymouth	Sprung leak; dry docked.	Lake Erie.
May 15	Str. Caledonia	Aground; released uninjured.	Abreast of Sarnia, St. Clair river.
May 15	Str. Saxon	Stranded; badly damaged.	Caribou Island, Lake Superior.
May 15	Str. H. W. Oliver	Aground; released.	Buffalo.
May 15	Str. F. W. Gilchrist	Aground; released.	Fort William, Ont.
May 15	Str. Ball Brothers	Blew out high pressure cylinder head.	On way to Duluth.
May 15	Str. W. D. Matthews	Aground; released.	Fort William, Ont.
May 15	Str. John Plankinton	Aground; released.	Fort William, Ont.
May 15	Str. Manitoba	Two holes punched in side by ice.	Fort William, Ont.
May 17	Str. Olympia	Heated shaft bearing melted babbitt.	Mackinaw City, Mich.
May 17	Str. Saxona	Stranded on rock bottom; badly damaged.	Entrance, Sault canal.
May 17	Str. Algonquin	Aground; released.	St. Lawrence river.
May 17	Str. James R. Langdon	Broke crank pin; towed to port.	Lake Huron.
May 17	Str. Fannie C. Hart	Broke wheel.	Sturgeon Bay.
May 21	Str. Naomi	Burned to water's edge.	Lake Michigan.
May 21	Bge. Emma C. Hutchinson	Stranded.	Sault Ste. Marie.
May 22	Str. Mohegan	Ashore.	Georgian Bay.
May —	Str. John T. Hutchinson	Collided with Str. Sultana; slightly damaged.	Lake Superior.
May —	Str. Sultana	Collided with Str. John T. Hutchinson.	Lake Superior.
May 22	Bge. S. B. Warriner	Went on bar.	Near Keweenaw.
May 22	Str. Onoko	Cracked outboard shaft.	Detour.
May 24	Str. Japan	Grounded, owing to buoy out of position.	Portage Lake.
May 25	Str. Lilly Smith	Went on beach; released.	Georgian Bay.
May 25	Tug William Kennedy	Squeezed against pier by Str. Roumania; rail and number of stanchions broken.	Cleveland, O.
May 25	Str. Black Rock	Broken wheel.	Milwaukee.
May 26	Str. Pere Marquette 16	Collided with dredge.	Sturgeon Bay, Wis.
May 26	Sch. Oneida	Stranded during gale; released.	North Manitou Island.
May 26	Str. Majestic	Aground; released.	Toledo.
May —	Tug R. C. Sullivan	Knocked out cylinder head.	Ashtabula.
May 27	Str. Western States	Broke away from tugs; hit dock; broke fenders.	Buffalo.
May 27	Str. C. F. Bielman and Bge. Mary E. McLachlan	Ashore in snowstorm.	Lake Huron.
May 27	Sch. John Schuette	Aground.	Fighting Island, Detroit river.
May 27	Sch. Sagamore	Lost steering gear.	Cleveland.
May 27	Str. Angeline	Struck while at anchor by Str. Saxona.	Lime Kiln Crossing.
May 27	Str. Saxona	Ran into Str. Angeline.	Lime Kiln Crossing.
May 27	Str. Patrick Culligan	Pounded by storm; sprung leak.	Lake Huron.
May 27	Tow barge Dolly Morden and scow	Carried on beach by storm.	Southampton, Ont.
May 29	Str. Charles Weston	Ashore in fog; released after lightering.	Outer Island, Lake Superior.
May 30	Str. Northern King	Lost wheel; went ashore.	Bar Point, Lake Erie.
May 30	Sch. Ed. Kelley	Aground; released.	Niagara river.
May 31	Str. William Chisholm	Struck rock; 13 plates damaged.	Sandusky Harbor.
May —	Tug Kate	Ashore; floated.	Farran's Point.
May —	Sch. F. D. Ewen	Sunk; raised.	Soulanges canal.
June 1	Str. Selwyn Eddy	Collided with Bge. Maida; sunk.	Detroit river.
June 1	Bge. Maida	Collided with Str. Selwyn Eddy; stem twisted.	Detroit river.
June 3	Str. Veronica	Ran on reef during fog; lost shoe.	Near Sturgeon Bay.
June 3	Sch. Theo. S. Fassett	Ran on reef during fog; twisted out of shape.	Near Sturgeon Bay.
June 4	Str. Sailor Boy	Aground in fog.	Green Bay.
June 5	Str. Utica	Struck; several bottom plates damaged.	Horseshoe Reef.
June 5	Str. W. J. Averell	Ashore.	Near Alexandria Bay.
June —	Str. United Lumbermen	Struck old wreck; released.	Niagar river.
June 7	Tug Vic Robinson	Caught in squall; beached in shallow water.	Lake St. Clair.
June 7	Str. John C. Gault	Struck while at dock by Str. Peshtigo; badly damaged.	Bay City, Mich.
June 8	Sch. C. C. Barnes	Grounded; released after lightering.	Niagara river.
June 8	Str. Eastland	Broke steering cable.	Cedar Point, Lake Erie.
June 8	Sch. Houghton	Smashed into dock; $2,000 damage.	Sarnia, Ont.
June 10	Bge. F. A. Georger	Broke rudder.	Lake St. Clair.
June 10	Bge. Cornwall	On the rocks; broken in two.	St. Lawrence river.

ACCIDENTS ON THE GREAT LAKES.

The list of accidents to lake vessels for the month shows a somewhat longer list than the preceding one, although but few were of a very serious character. The prevailing fogs, snowstorms and bad weather are accountable for many of the strandings, although the parted wheel chains and otherwise disabled steering gear still seem much in evidence.

The burning of the Crosby line steamer Naomi on Lake Michigan, with its accompanying loss of life is the most notable of the season's misfortunes. One of the serious accidents was the stranding of the steamer Saxon on Caribou island, Lake Superior, which at first looked like a big loss, but after being released, her injuries were found to be confined to the forepeak. The steamer Byron Whittaker was sunk in the Detroit river in collision with the steamer John C. Gault, but was later raised and repairs are now under way. The steamer Selwyn Eddy was also sunk in the Detroit river in collision with the barge Maida. The steamer Saxona stranded at the entrance to the Sault canal and was badly damaged.

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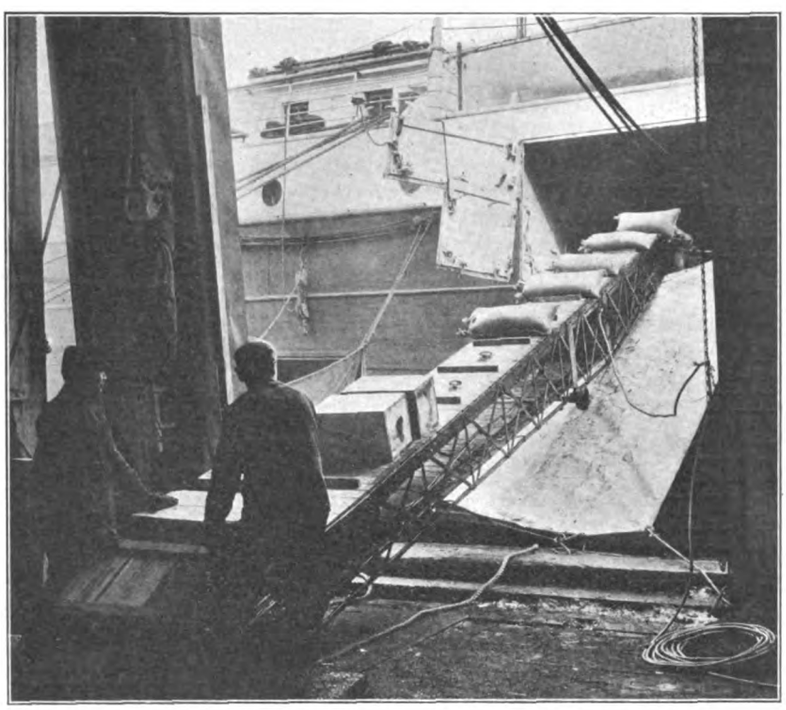
SPENCE ELECTRIC CONVEYOR.

The Spence Mfg. Co., St. Paul, Minn., is to install on the Western Transit Co.'s docks at Buffalo, two of their conveyors. This conveyor is meeting with considerable favor. The cut accompanying this article shows one of the conveyors on the docks of the Old Dominion Steamship Co. at Norfolk, Va. It is electrically driven and will convey and register from 3,000 to 5,000 sacks, cases, barrels or bundles per hour, according to size and weight. As a time, money and labor saver the



SPENCE ELECTRIC CONVEYOR AT WORK.

Spence conveyor is represented as being a decided success. The New York Edison Co. in one of its recent bulletins spoke of the conveyor of the Old Dominion Steamship Co.'s dock at Norfolk as follows:

"The portable conveyor is perhaps the most helpful piece of machinery on the wharf, as freight must be handled with dispatch and care, the machine can either be used in the hold of a vessel or on the wharf. It handles the freight so rapidly that twice the work can be accomplished that was heretofore possible. All sizes of boxes, bundles and bales are carried up and down on these conveyors."

It is computed that from $50 to $65 per day can be saved in loading or unloading through the use of these conveyors. Among the present users of the Spence conveyor are the Northern Pacific railway at Duluth, the Great Northern railway at Seattle, the Washington Stevedoring Co., Seattle, Wash., the Old Dominion Steamship Co., Norfolk, Va., and the Tehuantepec National railway at Rincon Antonio, Mexico.

LAUNCHING THE CITY OF SAVANNAH.

At 1:00 p. m., Tuesday, June 11, at the yards of the Delaware River Iron Ship Building & Engine Works, Chester, Pa., the new ship of the Ocean Steamship Co. was launched. As it gracefully glided off the ways it was christened the City of Savannah by Miss Susan Cole Winburn, the attractive young daughter of Mr. and Mrs. W. A. Winburn, of Savannah, Ga., who was presented by President Hanson on behalf of the company, with a beautiful Tiffany gold watch, inlaid with diamonds, appropriately engraved. With the completion of the City of Savannah, the latest addition of the splendid fleet of the Ocean Steamship Co. (Savannah Line), an important event in the history of this renowned company has been reached.

The arrangement for the handling and storage of cargo is similar to that of the other ships in the line, City of Atlanta, City of Columbus, etc. The passenger accommodations, however, as to capacity, arrangement of rooms, etc., differ very materially, there being fifty-eight cabin staterooms, some of which are en-suite, with private baths, accommodating 116 first cabin passengers; twelve intermediate rooms, three berths each, accommodating thirty-six passengers, and accommodations for sixty steerage passengers.

Two of the cabin staterooms contain large double brass beds, sofas, comfortable chairs and writing desk; the private baths are furnished with hot and cold, fresh and salt water, an innovation to be found only on this line.

The hull of the city of Savannah is constructed under the cellular or double water bottom system, channel steel construction, with channel frames, beams, stringers and ties, and is constructed in the highest class under the United States Standard Steamship Owners and Builders Underwriter's rules, and especial survey by their representative to Class A1 for twenty years.

The dimensions of the new steamer are as follows: Length on 20-ft. water line, 376 ft.; length over all, 403 ft.; breadth of beam, molded, 49 ft.; depth, molded, 27 ft. The spar and main decks are of steel, the hurricane and promenade decks are of steel covered with asbestos and then planked and covered with canvas, making the passenger deck apart from the freight accommodations and fireproof. Water ballast capacity, 916 tons; bunker capacity, 428 tons, cubic freight capacity, 352-500 ft.; deadweight capacity of cargo and coal on mean draught, 18 ft. 6 inches, 3,500 tons; speed when loaded, 13 knots. The gross tonnage of the City of Savannah will be about 5,900 tons, or 350 tons larger than her sister ships the City of Atlanta and City of Columbus.

There are four decks extending fore and aft, accommodations for 92 first cabin passengers are furnished on the hurricane deck, 24 first cabin passengers on the promenade deck. The dining saloon which is located forward is elaborately decorated, while the smoking room, sun parlor, officer's quarters and pilothouse are located on the promenade deck. The ship is electric lighted throughout, with a perfect system of electric bells.

The vessel will be equipped with one triple-expansion engine, diameter of cylinders, high pressure, 20 in.; intermediate, 46 in.; low pressure, 75 in.; stroke of piston, 48 in.; steam from four single end boilers, 14 ft. 9 in. diameter; length, 10 ft. 6 in.; pressure of steam, 180 lbs. Blake pump feed water heater and filter will be used, steam steering engine of the most approved style, Hype capstan and windlass, also Baldt pattern stockless anchors.

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